



SERVICE MANUAL

TR-7730

VHF FM TRANSCEIVER



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SPECIFICATIONS/CIRCUIT DESCRIPTION

[General]

Semiconductors	ICs	15 (K, M) 16 (W, T)
	Transistors	46 (K, M) 49 (W, T)
	FETs	7
	Diodes	91 (K, M) 95 (W, T)
Frequency range	144.000 to 147.995 MHz (K, M)	144.000 to 145.995 MHz (W, T)
Frequency synthesizer	Digital control, phase locked VCO	
Mode	FM (F3)	
Antenna impedance	50 ohms	
Power requirement	13.8 V DC ± 15%	
Grounding	Negative	
Operating temperature	- 20°C to + 60°C	
Current drain	0.4A in receive mode with no input signal 5.5A in HI transmit mode (Approx.) 3A in LOW transmit mode (Approx.) Less than 2.5 mA for memory back up (from power supply)	
Dimensions	147.5 mm (5-3/4") wide 51.5 mm (2") high 198.0 mm (7-3/4") deep (projections excluded)	
Weight	1.5 kg (3.3 lbs) (Approx.)	

[Transmitter Section]

RF output power (at 13.8 V DC, 50 Ω load)	HI 25 Watts min. LOW 5 Watts approx. (Adjustable)
Modulation	Variable reactance direct shift
Frequency tolerance	Less than ± 20 × 10 ⁻⁶ (- 10°C ~ + 50°C)
Spurious radiation	HI Less than - 60 dB LOW Less than - 53 dB
Maximum frequency deviation (FM)	± 5 kHz
Microphone	Dynamic microphone with PTT, up, down, switches, 500 Ω

[Receiver Section]

Circuitry	Double conversion superheterodyne
Intermediate frequency	1st IF 10.7 MHz 2nd IF 455 kHz
Receiver sensitivity	Better than 0.5 μV for 30 dB S/N Better than 0.25 μV for 12 dB SINAD
Receiver selectivity	More than 12 kHz (- 6 dB) Less than 25 kHz (- 60 dB)
Spurious response	Better than 60 dB
Squelch sensitivity	0.16 μV (threshold)
Audio output	More than 2.0 watts across 8 ohm load (10% dist.)

Note: Circuit and ratings are subject to change without notice due to developments in technology.

NOTE : Letter designations used in this manual :

K U.S.A. X AUSTRALIA
T BRITAIN M GENERAL MARKET
W EUROPE

< RECEIVER SECTION >

RX.TX UNIT (X44-1450-XX)

The antenna signal is applied to the RF amplifier (Q3 : 3SK76), a dual gate MOS FET and helical resonator L5 (3 poles) and L6 (2 poles), and is then converted to the 10.7 MHz 1st IF signal by Q4, the 1st mixer.

A 2-stage MCF (Monolithic crystal filter) is used in the 1st IF stage. All this achieves high dynamic range and high sensitivity.

The 1st IF signal, after passing through the MCF, is mixed with the 10.245 MHz 2nd local oscillator signal, generated by Q5 to obtain a 455 kHz 2nd IF signal.

This signal passes through the ceramic filter ICFW455F and is amplified by IC1, Q7 through Q10, and is then demodulated. An S meter signal is obtained by detecting the signal from the collector of Q7 by diodes D2 and D3, and is then applied to the display unit. The S meter uses 8 LEDs, and indicates 6 amber and 1 red LED when the antenna input level is 15 dBμ.

CIRCUIT DESCRIPTION

Item	Rating
Nominal center frequency (f_0)	10.7 MHz
Pass bandwidth	$f_0 \pm 7.5$ kHz or more at 3 dB
Attenuation bandwidth	$f_0 \pm 25$ kHz or less at 40 dB $f_0 \pm 45$ kHz or less at 60 dB
Guaranteed attenuation	70 dB or more within $f_0 \pm 1$ MHz 80 dB or more within $f_0 - (910 \text{ kHz} \pm 10 \text{ kHz})$
Spurious	40 dB or more within f_0 to $f_0 + 500$ kHz
Ripple	1.0 dB or less
Loss	1.5 dB or less
Input and Output impedance	3 k Ω
Operating temperature	-20°C~+70°C

Table 1 MCF (L71-0219-05) (RX.TX unit, L17)

Item	Rating
Nominal center frequency	455 kHz
6 dB bandwidth	± 6 kHz or more
50 dB bandwidth	± 12.5 kHz or less
Ripple (within 455 ± 4 kHz)	3 dB or less
Loss	6 dB or less
Guaranteed attenuation (within 455 ± 100 kHz)	35 dB or more
Input and output impedance	2.0 k Ω

Table 2 Ceramic filter CFW455F (L72-0315-05) (RX.TX unit, L18)

Item	Rating
Center frequency and deviation	455 kHz ± 1.0 kHz
Peak separation	15 kHz or more
Voltage sensitivity (at 455 kHz)	15 mV/kHz or more
Operating temperature	-10°C~+50°C

Table 3 Ceramic discri CFY455S (L79-0446-05) (RX.TX unit, L19)

< TRANSMITTER >

RX.TX UNIT (X44-1450-XX)

The microphone signal is amplified and limited by IC2 (TA7061AP), and is then applied to D1 (1S2208) in the PLL unit to directly modulate the VCO. The VCO generates 144~145.995 MHz (W, T) or 143.9~148.995 MHz (K, M) according to the control signal from the microprocessor.

The VCO signal is amplified by Q2 and Q3 in the PLL unit, and then applied to the RX.TX unit via the LT terminal. The signal is amplified by Q1 and Q2 before it is applied to the power module. This simple transmitter structure provides superior spurious radiation characteristic.

The HIGH/LOW switch signal is applied to Q28, Q22 and Q21 in the RX.TX unit, which controls the B+ voltage applied to the driver stage (Q2), so that final input and output power is varied. The RF meter is adjusted so that 6 amber LEDs light at HIGH power. However, the number of LEDs on may vary according to the VSWR of the antenna system.

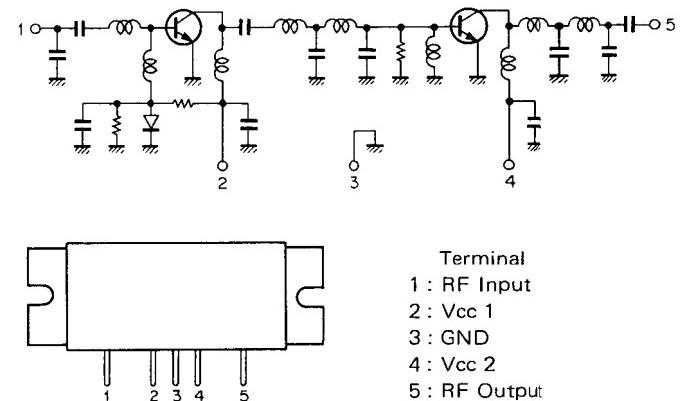


Fig. 1 POWER MODULE VP-15E1305

Item	Symbol	MAX Rating	Condition
Power supply voltage	Vcc	17V	Tc = 25°C
DC current	Icc	8A	Tc = 25°C
Operating case temperature	Top	-30~100°C	
Storage temperature	Tstg	-40~110°C	

VP-15E1305 MAX Rating

Item	Symbol	Condition	Rating			Unit
			MIN	TYP	MAX	
f range	f		144		148	MHz
Power input	Pin			250		mW
Power output	Po	Pin = 250 mW Vcc = 13.0 V	30			W
Operating voltage	Vcc			13.0		V
Input and output impedance	Z	Pin = 250 mW Vcc = 13.0 V		50		Ω
Total efficiency	η_T	Pin = 250 mW Vcc = 13.0 V	45	50		%

VP-15E1305 Electrical Characteristic

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CIRCUIT DESCRIPTION

PLL CIRCUIT (X50-1750-10)

VCO Q1 : 2SK19 (GR) generates 143.900~148.995 MHz (K, M) or 144.00~145.995 MHz (W, T) during transmission and 133.200~138.295 MHz (K, M) or 133.30~135.295 MHz (W, T) during reception.

The VCO signal is buffered by Q2 and amplified by Q3 and Q4. It is then mixed with the HET signal (from Q5) by Q12 to obtain a PLL IF signal (5.4~10.495 MHz [K, M] or 5.5~7.49 MHz [W, T]).

The HET signal is generated by Q5, a third overtone oscillator using a 46.1666 MHz crystal to generate 138.5 MHz for transmission and a 42.6 MHz crystal to generate 127.8 MHz for reception. Both frequencies are shifted 5 kHz when the 5K control signal from the control unit (X53-1120-10) is applied to D9 and D10 to shunt TC3 and TC4.

The resonant frequencies of L5, L7, L10, and the VCO tank circuit and the HET frequency are switched for reception and transmission using the 8R (8V DC during reception) and 8T (8V DC during transmission) control lines.

The PLL IF signal is amplified by Q10 and buffered by Q11 and Q9, and then applied to pin 2 of IC3 (TC9122P) the programmable divider. IC3 is supplied with frequency dividing data from the control unit : 550~1049 (K, M) or 550~749 (W, T) in BCD, and the PLL IF frequency is also divided to a 10 kHz signal for a phase-lock comparison signal. IC2 (TC5082P-GL) is the 10.24 MHz oscillator. Its output is divided by 1024 to 10 kHz for IC1's reference signal. These comparison and reference signals are input to the phase comparator (IC1 : TC5081P) and the resultant DC output signal is applied through the low pass filter Q8 and Q7 to the VCO tank circuit through varicap diode (D2 : 1S2208) to control the VCO output frequency. If the PLL unlocks, the voltage at IC1 pin4 drops to turn off Q6 and D11, which shuts off Q3.

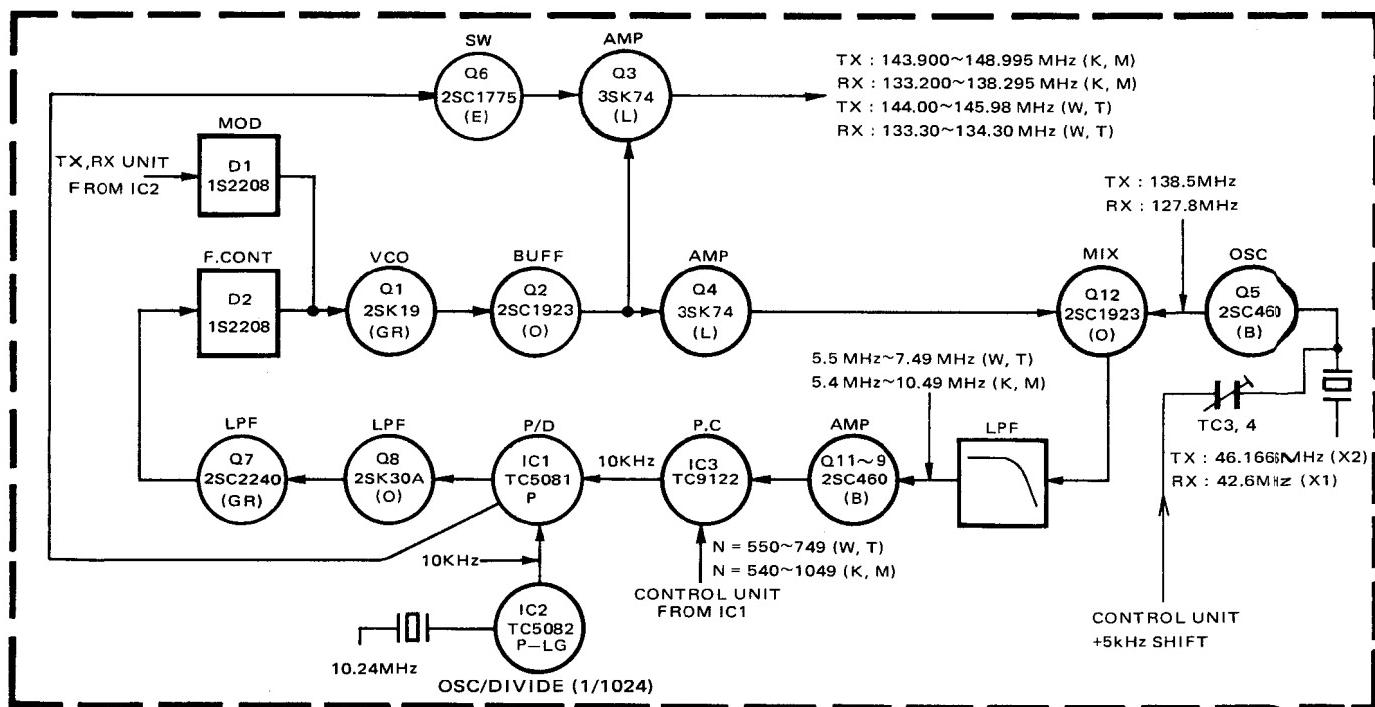


Fig. 2 PLL unit block diagram

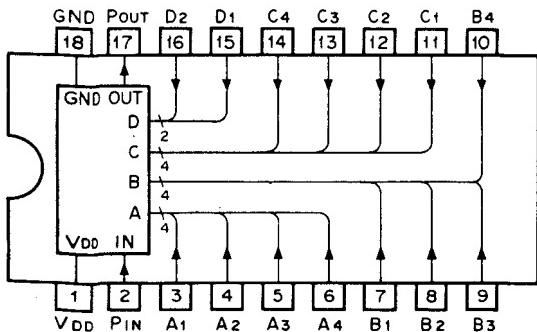
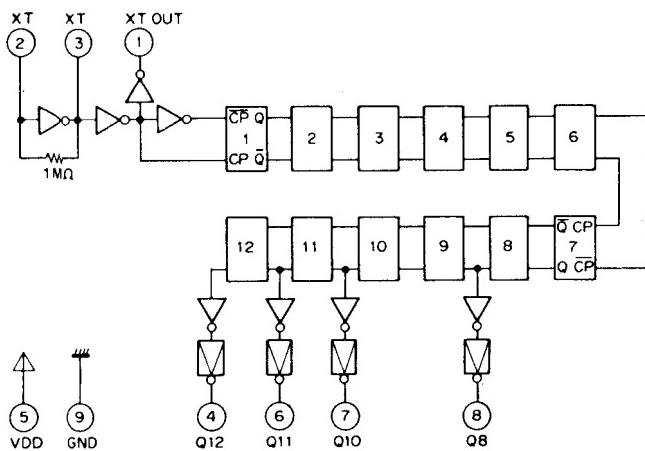


Fig. 3 TC9122P (PLL unit, IC3)

Table 4 TC9122P (PLL unit, IC3)

CIRCUIT DESCRIPTION



PIN NO	8	7	6	4	1
PIN NAME	Q ₈	Q ₁₀	Q ₁₁	Q ₁₂	XTout
Dividing ratio	1/256	1/1024	1/2048	1/4096	1/1
Output frequency X-tal 10.24 MHz	40 kHz	10 kHz	5 kHz	2.5 kHz	10.24 MHz

Fig. 4 TC5082P-GL (PLL unit, IC2)

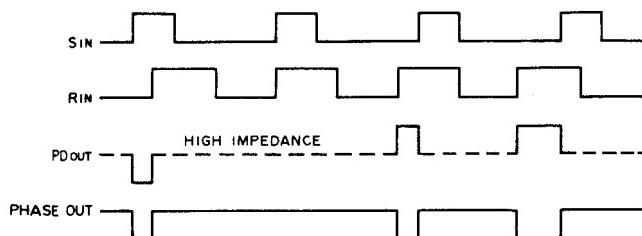


Fig. 5-A TC5081P (PLL unit, IC1) Timing chart

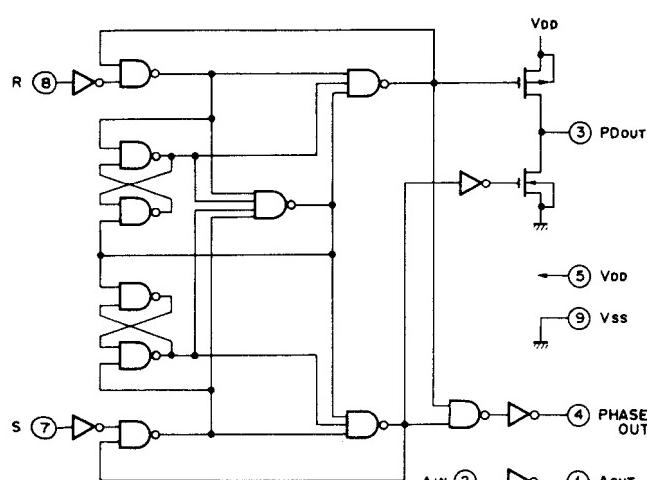


Fig. 5-B TC5081P (PLL unit, IC1) Equivalent circuit

CONTROL CIRCUIT (X53-1230-10)

Fig. 6 shows a block diagram of the control circuit, which uses a microprocessor to minimize the number of peripheral circuits.

● Frequency Indicator

The frequency indicator uses a 4 digit dynamically driven LED display. The BCD data from the microprocessor D port (pins 8~11) is converted by decoder driver IC2 (TC 5022BP) into the segment signals which are applied to the corresponding segments of all digits. The signals from the E port (pins 12~15) turn ON Q7 through Q10 (2SC1959) to light the digits.

● PLL Data (Frequency Dividing Data)

The frequency dividing data is output from ports D, E, G, H and I (pins 9~11, 12, and 22~32) in BCD. It is 550 when 4.00 is displayed, 650 when 5.77 is displayed, 749 when 5.99 is displayed and 1049 (K, M only) when 8.99 is displayed.

● Reset Circuit

Current flows through D36 when the power source voltage supplied to the microprocessor exceeds about 3.5V. The collector voltage of Q5 (2SC1815 (Y)) then becomes H and a pulse is generated by the CR differentiating circuit. This pulse is applied to and resets the microprocessor.

● Switch Circuit

One terminal of each control switch is connected to one of the control pulse signal output terminals of the microprocessor and the other terminal to one of the input terminals. When a control switch is turned ON, the corresponding output pulse signal is input to the corresponding input terminal and the prescribed function is performed. Diodes are used to prevent the control pulse signals from being input to the wrong circuit.

● Encoder and UP/DOWN Switch Input Circuit

The mechanical encoder output signals are applied to the Schmitt circuits formed by IC102 (TC7404UBP), then applied to part A (pins 33~36) of the microprocessor. The microprocessor judges UP/DOWN and counts the number of applied pulses. One turn of the dial equals 50 step output.

● Scan Circuit

Scan operation is controlled entirely by the microprocessor. It starts when the SCAN switch is pressed and stops when either the HOLD switch is pressed or the transmit signal (8T) becomes H. Scan operation temporarily stops when the squelch stop signal (input to the SS terminal) becomes H. Variation of the frequency dividing data for the least significant digit is detected by the circuit consisting of Q1, Q2 and the OR circuit D10~13 so that a pulse is obtained every time the data changes. This pulse signal is applied to the scan stop terminal (pin 4) of the microprocessor to momentarily suspend slow scanning after the frequency has been changed.

CIRCUIT DESCRIPTION

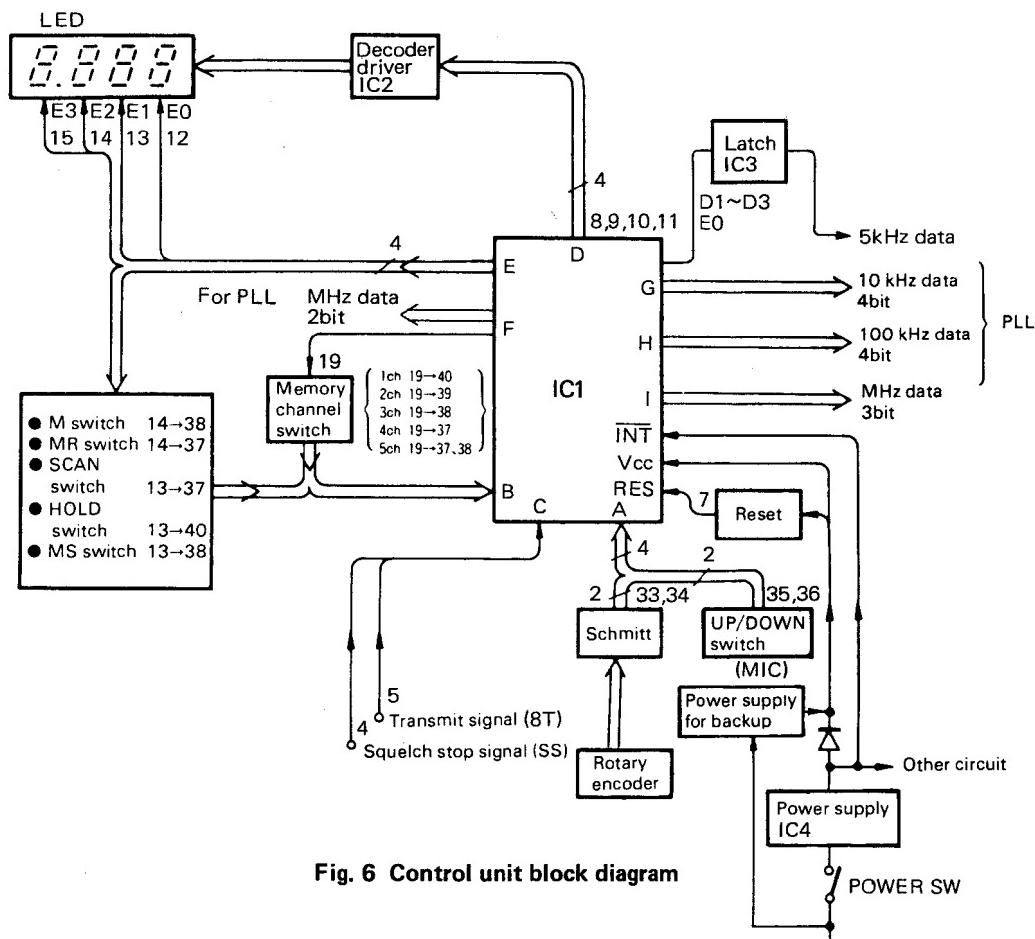


Fig. 6 Control unit block diagram

Pin No.	Pin	Input signal	Output signal	Note	Pulse signal
1	CL1			Clock signal 400 kHz	
2	PC0			Normally L	
3	PC1	○		Normally L	
4	PC2	○		Squelch signal, SCAN stops when H.	
5	PC3	○		Normally L, H during transmission.	
6	INT	○		Normally H	
7	RES	○		Microprocessor is reset when H.	
8	PD0	○	○	10 kHz, 100 kHz, and MHz digit signals are output.	○
9	PD1	○	○		○
10	PD2	○	○		○
11	PD3	○	○		○
12	PE0		○	5 kHz digit signal is output.	○
13	PE1		○	10 kHz digit signal, SCAN, HOLD or M.S is output.	○
14	PE2		○	100 kHz digit signal, M or MR is output.	○
15	PE3		○	1 MHz digit signal is output.	○
16	PF0			Not connected.	
17	PF1		○	1 MHz data signals for PLL	L
18	PF2		○		L
19	PF3		○	Memory output signal	○
20	TEST			Normally H	
21	Vcc			5V power supply	

Pin No.	Pin	Input signal	Output signal	Note	Pulse signal
22	PG0		○	(Level at 1450 MHz) A B C D	A B C D
23	PG1		○		10 kHz data signals for PLL
24	PG2		○		
25	PG3		○		
26	PH0		○	100 kHz data signals for PLL	A B C D
27	PH1		○		
28	PH2		○		
29	PH3		○		
30	PI0		○	1 MHz data signals for PLL	A B C
31	PI1		○		
32	PI2		○		
33	PA0	○		Encoder signal	
34	PA1	○		Encoder signal	
35	PA2	○		Normally H, L when MIC UP switch is pressed.	
36	PA3	○		Normally H, L when MIC DOWN switch is pressed.	
37	PB0	○		MR, SCAN, Memory CH4 or 5 pulse signal is input.	○
38	PB1	○		M, MS, Memory CH3 or 5 pulse signal is input.	○
39	PB2	○		Memory CH2 pulse signal is input.	○
40	PB3	○		STEP or Memory CH1 pulse signal is input.	○
41	GND			GND	
42	CL0			Clock signal 400 kHz	

Table 5 Microprocessor Functions μPD650C-021 (Control unit, IC1)

CIRCUIT DESCRIPTION

● Power Supply for control system

Transistor Q6 (2SC496 (Y)) generates 5V for the frequency display. A 6V AVR (Automatic voltage regulator) IC (IC4 : NJM78L06K) supplies power to the microprocessor through diode D18.

● Backup Circuit

The level at the microprocessor INT terminal becomes L when the POWER SW is turned OFF, and the microprocessor enters the backup mode. In this mode, all output ports are low to minimize power consumption. At power OFF, the backup supply is Q24 (2SC2603 (E)) on the RX.TX unit.

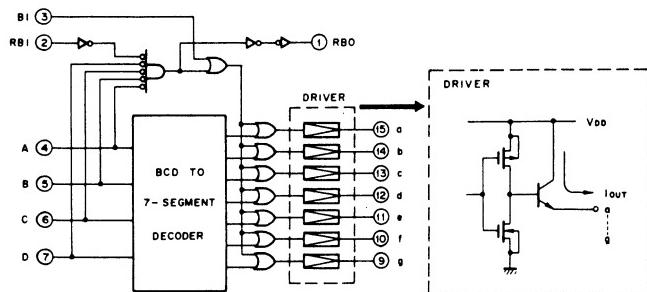


Fig. 7 TC5022BP (Control unit, IC2) Equivalent circuit

INPUT					OUTPUT								
B	I	RBI	A	B	C	D	a	b	c	d	e	f	g
H	*	*	*	*	*	*	L	L	L	L	L	L	☆
L	H	L	L	L	L	L	L	L	L	L	L	H	
L	L	L	L	L	L	H	H	H	H	H	H	L	
L	*	H	L	L	L	L	H	H	L	L	L	L	
L	*	L	H	L	L	H	H	L	H	H	L	L	
L	*	H	H	L	L	H	H	H	H	L	L	L	
L	*	L	L	H	L	H	L	H	H	L	H	L	
L	*	H	H	L	H	L	H	H	L	H	H	L	
L	*	L	H	H	L	H	L	H	H	L	H	L	
L	*	H	H	H	H	H	H	H	H	H	H	L	
L	*	L	L	H	H	H	H	H	H	L	H	L	
L	*	H	H	H	H	H	H	H	H	L	H	L	
L	*	L	H	H	H	H	H	H	H	L	H	L	
L	*	H	H	H	H	H	H	H	H	L	H	L	
L	*	H	H	H	H	H	H	H	H	L	H	L	

☆ : Undetermined
* : Don't Care

Table 6 TC5022BP (Control unit, IC2) Truth table

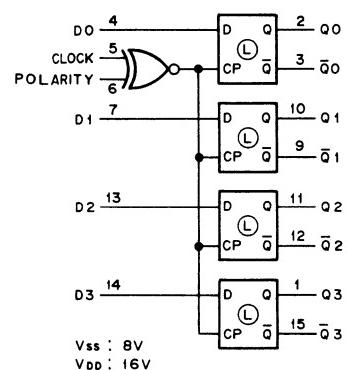


Fig. 8 TC4042BP Block diagram

INPUTS		OUTPUT
CLOCK	POLARITY	Qn *
H	H	Dn
L	L	Dn
	L	LATCH
	H	LATCH

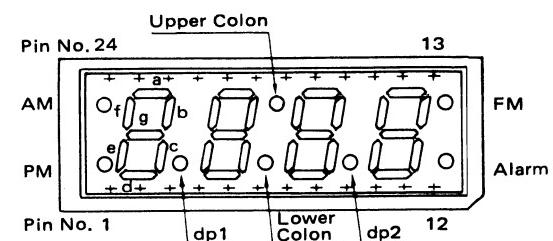
△ Level change

* n : 0~3

Table 7 TC4042BP Truth table

When the POWER SW is turned ON, the levels at both the INT (pin 6) and UP/DOWN (pins 35 and 36) terminals become H, returning the microprocessor to operation as before the POWER SW was turned OFF.

Input port B pins (37~40) are grounded by Q3 and Q4 when the POWER SW is turned OFF, and scan operation is stopped by momentarily simulating the transmission mode through Q11.



PIN NO	FUNCTION	PIN NO	FUNCTION		
1	PM	Anode	13	FM, Alarm	Cathode
2	Dig 1	Cathode	14	FM	Anode
3	Seg d	Anode	15	Seg a	Anode
4	dp 1	Anode	16	dp 2	Cathode
5	Dig 2	Cathode	17	Upper/Lower Colon	Cathode
6	Lower Colon	Anode	18	Seg f	Anode
7	Upper Colon	Anode	19	Seg b	Anode
8	Dig 3	Cathode	20	Seg c	Anode
9	dp 2	Anode	21	dp 1	Cathode
10	Dig 4	Cathode	22	Seg g	Anode
11	Seg e	Anode	23	AM	Anode
12	Alarm	Anode	24	AM, PM	Cathode

Fig. 9 4-digit LED LN543RK (Display unit, D1)

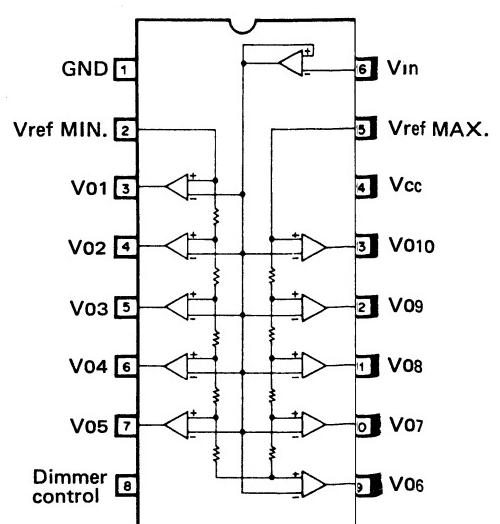
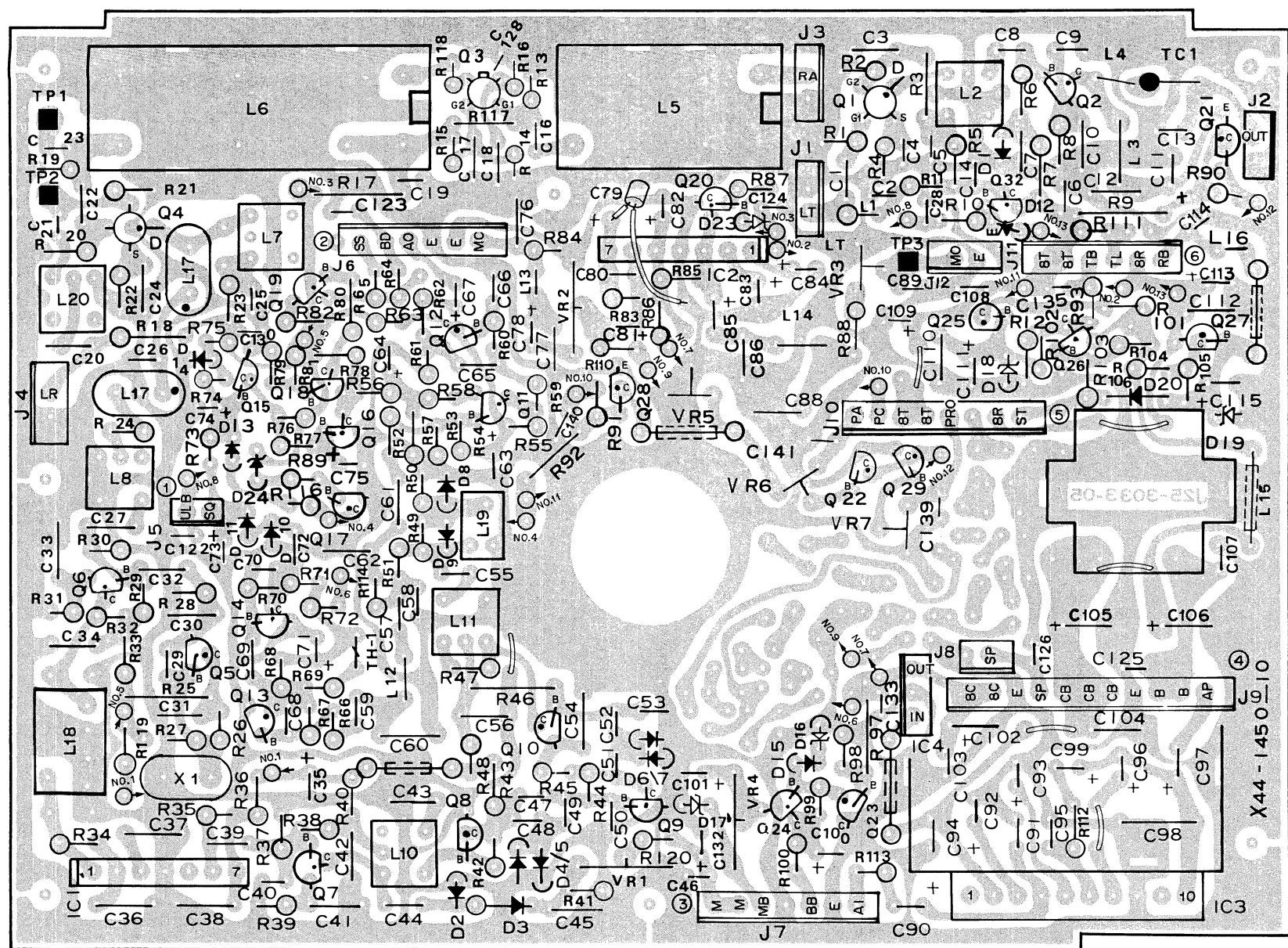


Fig. 10 TA7612AP (Display unit, IC1)

TR-7730 PC BOARD VIEW

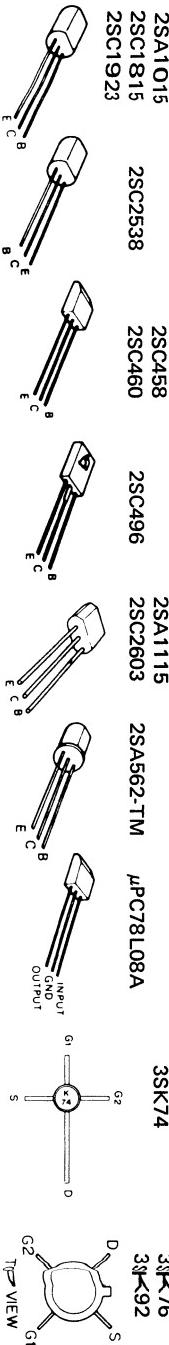
▼ RX.TX UNIT (X44-1450-10) (K, M TYPE) Components side view



Q1,4 : 3SK74(L) Q2 : 2SC2538 Q3 : 3SK76 or 3SK92 Q5, 7~10 : 2SC460(B) Q6 : 2SC1923(O) Q11~14 : 2SC1815(Y) Q15~18, 20, 23, 24 : 2SC2603(E)
Q19 : 2SA1115(E) Q21, 25, 27 : 2SC496(Y) Q22, 28, 29 : 2SC458(B) Q26 : 2SA1015(Y) Q32 : 2SA562TM(Y)

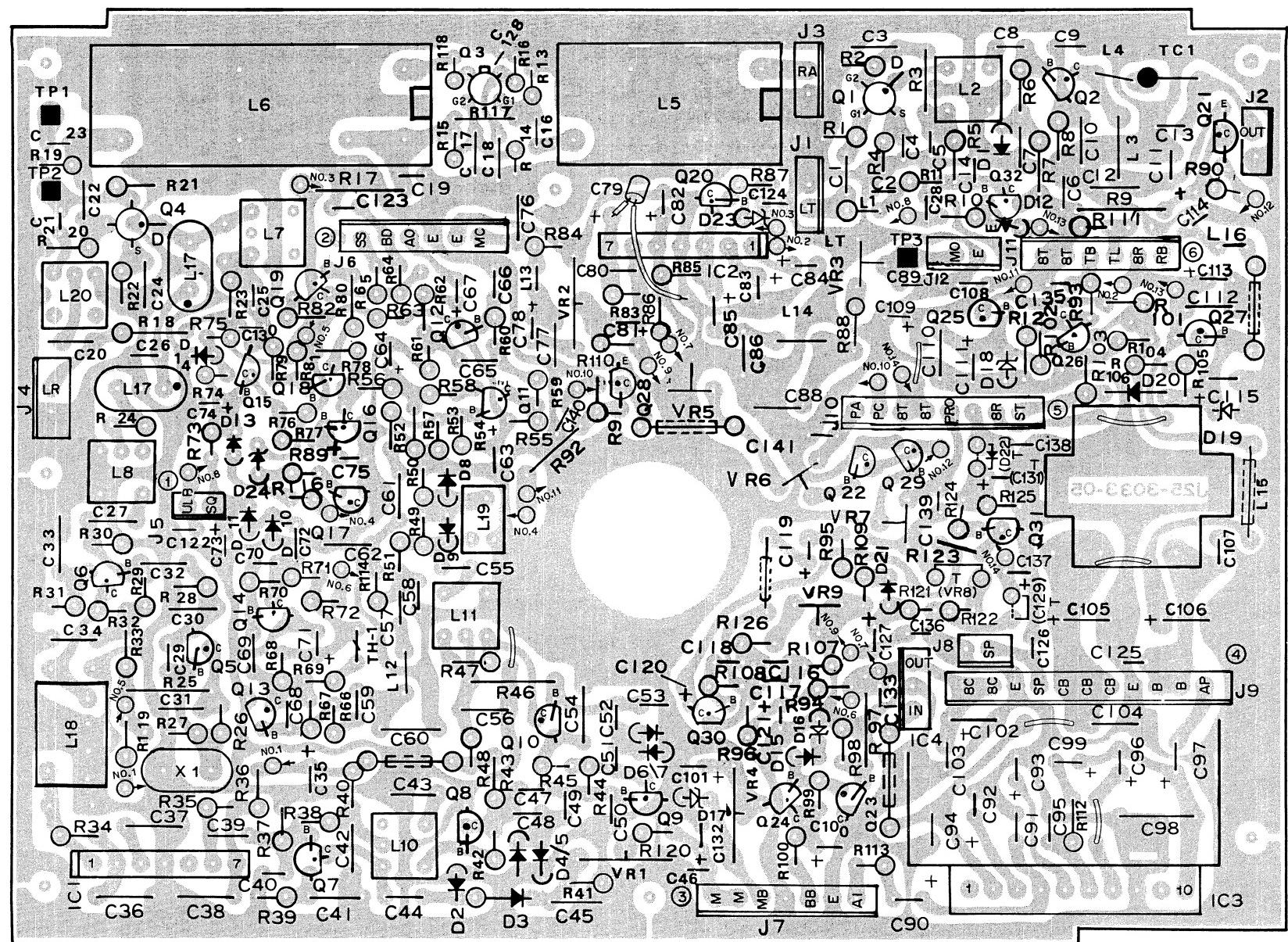
IC1 : TA7302P IC2 : TA7061AP IC3 : HA1366W IC4 : μPC78L08A

D1, 4~7, 12, 13, 15, 20 : 1S1555 D2, 3, 8~11 : 1N60 D14 : 1S1212 D16 : XZ-060 D17 : XZ-070 D18 : XZ-100 D19 : XZ-090 D23, 24 : WZ-040



PC BOARD VIEW TR-773

▼ RX.TX UNIT (X44-1450-51, -61) (T, W TYPE) Components side view



Q1,4 : 3SK74(L) Q2 : 2SC2538 Q3 : 3SK76 or 3SK92 Q5,7~10 : 2SC460(B) Q6 : 2SC1923(O) Q11~14 : 2SC1815(Y) Q15~18, 20, 23, 24 : 2SC2603(E)

Q19 : 2SA1115(E) Q21, 25, 27 : 2SC496(Y) Q22, 28~31 : 2SC458(B) Q26 : 2SC1015(Y) Q32 : 2SA562TM(Y)

IC1 : TA7302P IC2 : TA7061AP IC3 : HA1366W IC4 : μPC78L08A

D1, 4~7, 12, 13, 15, 20~22 : 1S1555 D2, 3, 8~11 : 1N60 D14 : 1S1212 D16 : XZ-060 D17 : XZ-070 D18 : XZ-100 D19 : XZ-090 D23, 24 : WZ-040

TA7061AP
TA7302P

HA1366W

< Attachment direction of L17 >

< Attachment direction of L5, 6 >

< Attachment direction of IC4 >

T

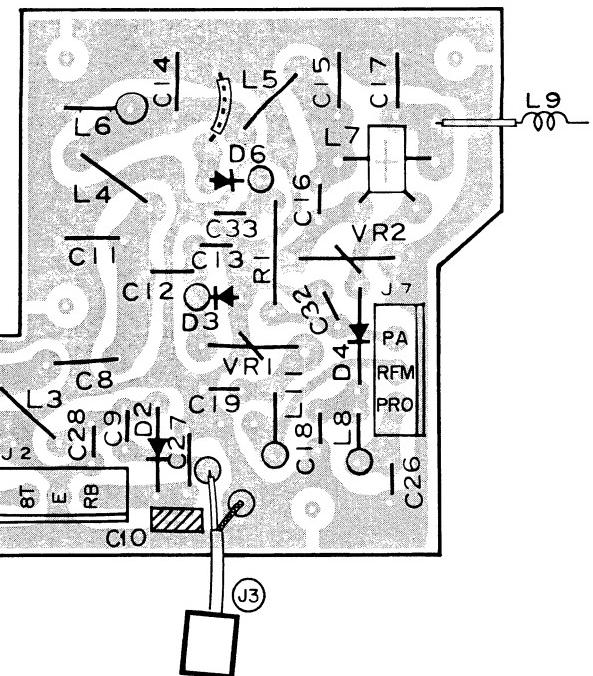
W

	T	W
D22	Used	Not used
VR8	Used	Not used
C129, 131	Used	Not used

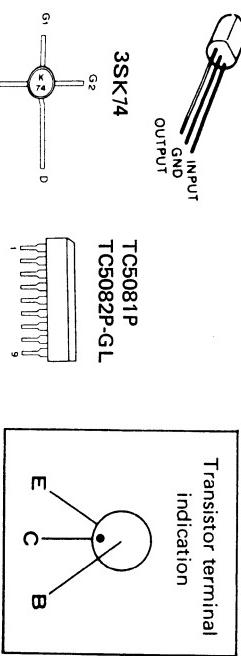
L17 should be used as a pair.

TR-7730 PC BOARD VIEWS

▼FINAL UNIT (X45-1190-10) Components side view

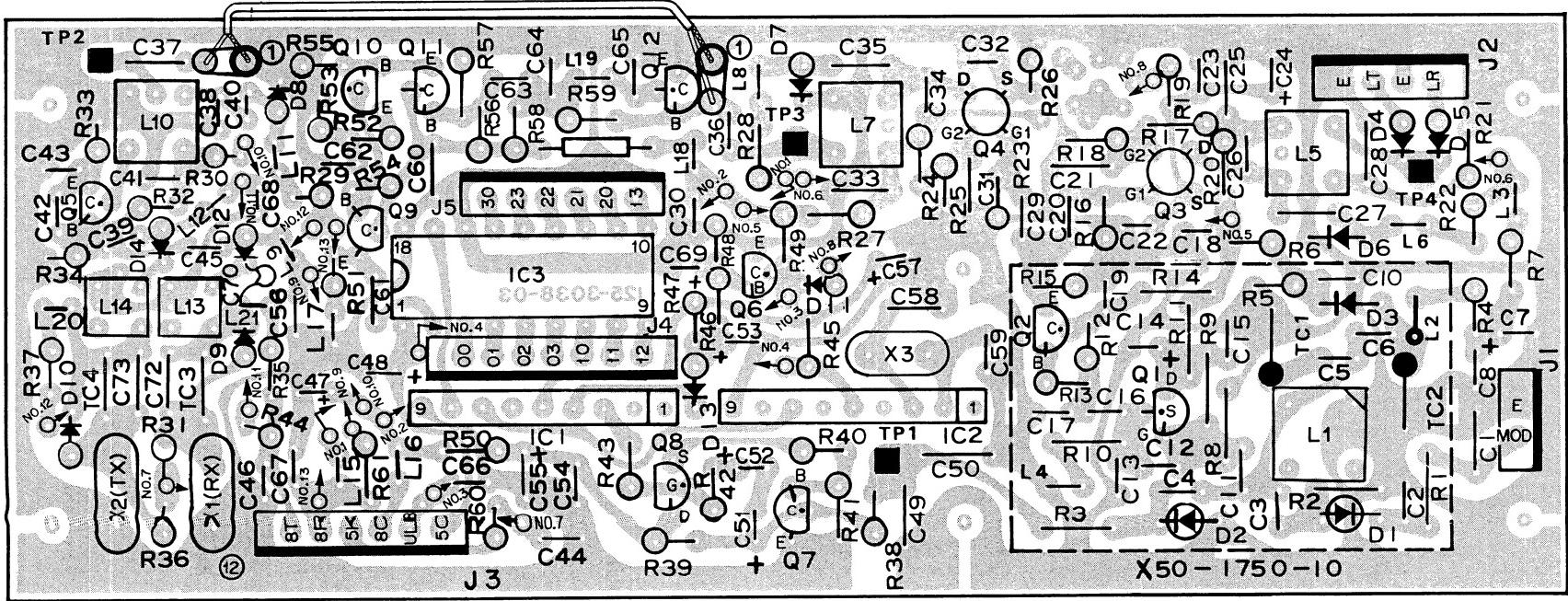


IC1 : VP-15E1305 D1 : MI-402 D2 : MI-303 D3 : 1N60 D4, 6 : 1SS99



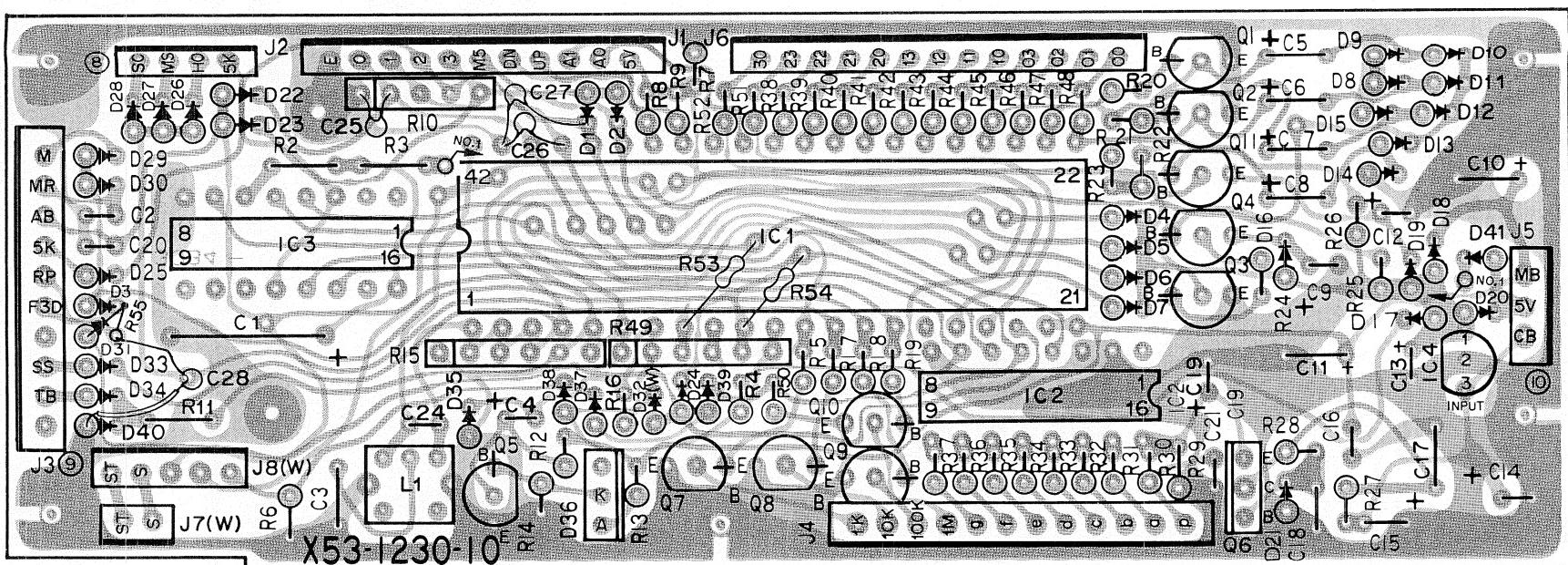
O1 : 2SK19(GR) O2, 12 : 2SC1923(O) O3, 4 : 3SK74(L)
 O5, 9~11 : 2SC460(B) O6 : 2SC1775(E) O7 : 2SC2240(GR)
 O8 : 2SK30A(O) IC1 : TC5081P IC2 : TC5082P-GL IC3 : TCG9122P
 D1, 2 : 1S2208 D3 : 1S2588 D4, 5, 9, 10, 12, 14 : BA243S
 D6~8 : 1S1555 D11, 13 : 1N60

▼PLL UNIT (X50-1750-10) Components side view

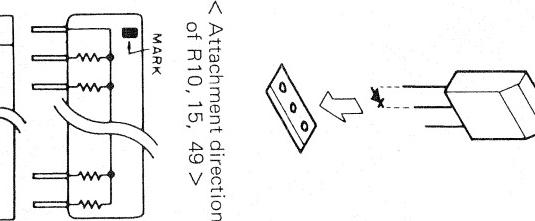


PC BOARD VIEWS TR-773

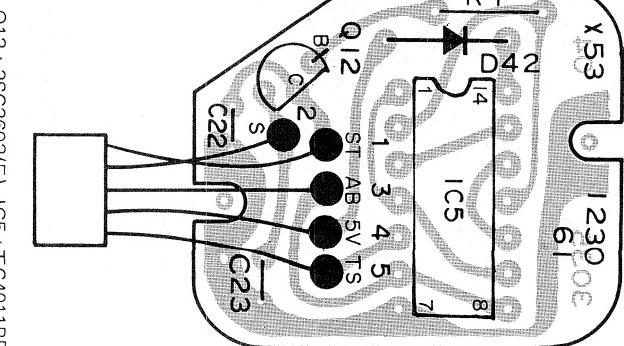
▼ CONTROL UNIT (X53-1230-10, -61) -10: K, M -61: T, W Components side view



< Attachment direction
of R10, 15, 49 >



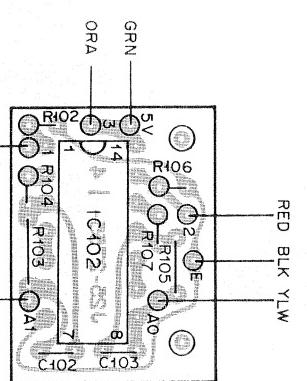
▼ CONTROL UNIT (X53-1230-61) T, W TYPE ONLY Components side view



▼ SCHMITT BOARD (J25-2755-14) Components side view

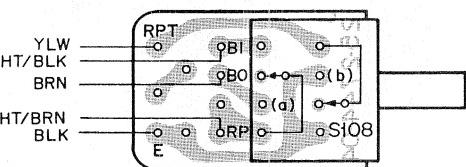
Q12: 2SC2603(E) IC5 : TC4011BP

D42: 1N60

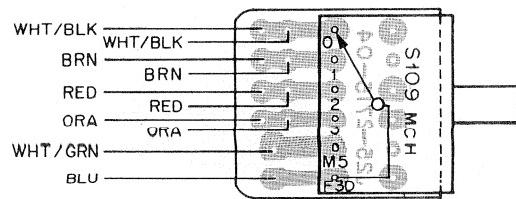


▼ RPT BOARD (J25-2744-04) Components side view

IC102 : TC7404UBP

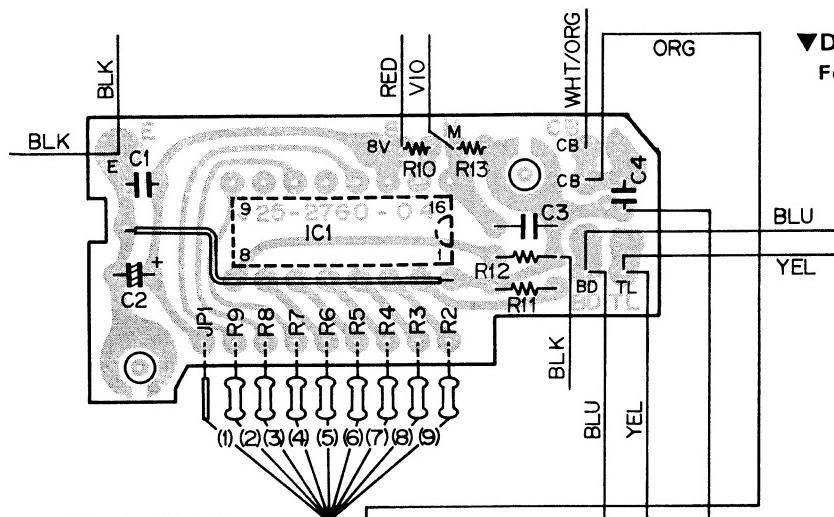


▼ 10k/5k or 25k/5k, HI/LOW BOARD (J25-2756-04) Components side view



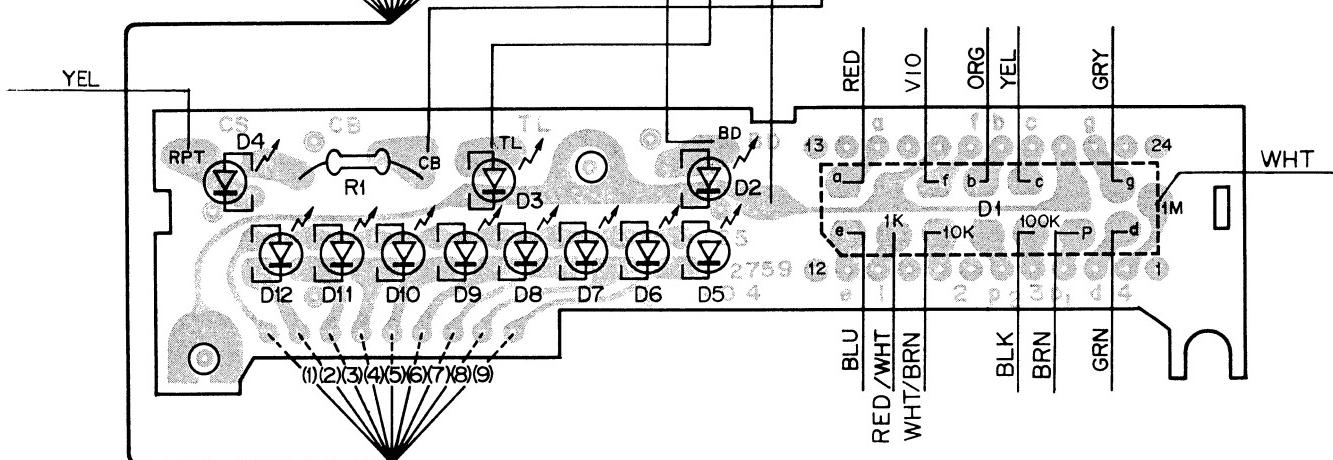
Q1~3, 5 : 2SC1815(Y) Q4, 11 : 2SA1015(Y) Q6 : 2SC496(Y)
Q7~10 : 2SC1959(Y) IC1 : μ PD650C-078 IC2 : TC5022BP
IC3 : TC4042BP IC4 : NUM78L06K
D1~3, 8~15, 22~31, 33, 34 : 1N60
D4~7, 16~20, 35, 37~39 41 : ST555 D21 : XZ060
D32 : 1N60 (T, W only) D36 : MA522 (Q) D40 : XZ090

TR-7730 PC BOARD VIEWS

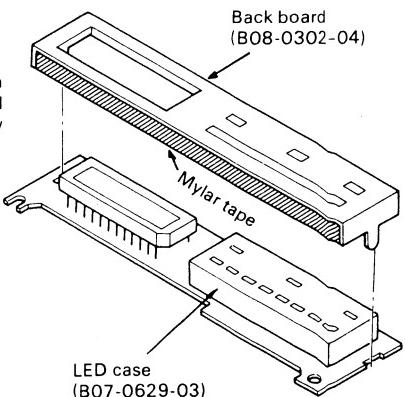
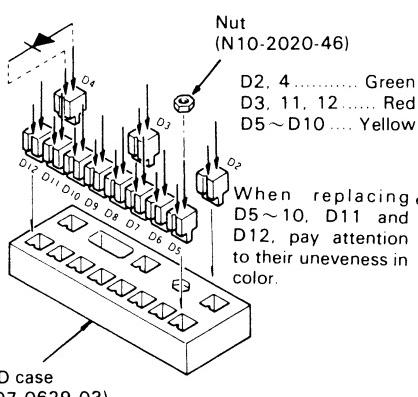
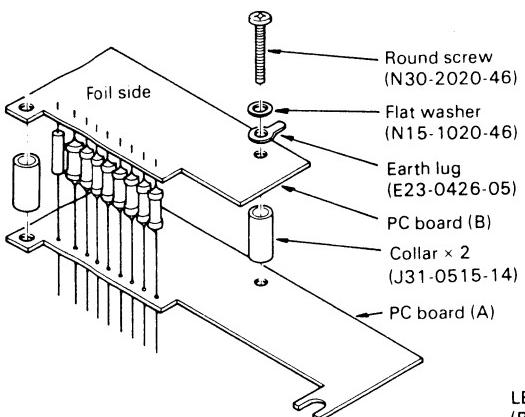


LN233RP
LN333GP
LN433YP

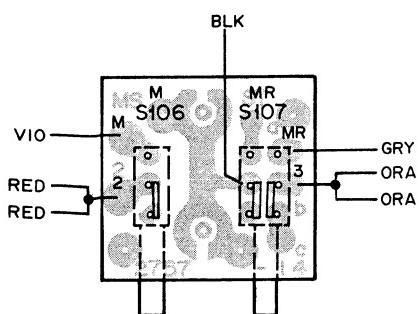
IC1 : TA7612AP
D1 : LN543RK
D2, 4 : LN333GP
D3, 11, 12 : LN233RP
D5~10 : LN433YP



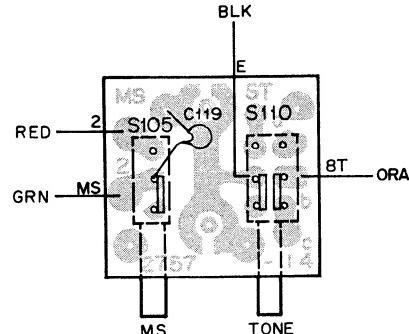
RED / WHT
WHT / BRN
BLK / BRN
GRN



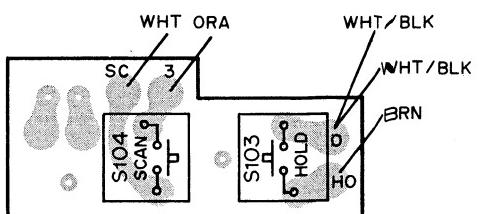
M, MR BOARD (J25-2757-14)
Foil side view



M.S, TONE BOARD (J25-2757-14)
Foil side view



SCAN, HOLD BOARD (J25-2758-14)
Components side view



PARTS LIST

Note 1: K: U.S.A. T: Britain W: Europe X: Australia

Note 2:

Note 2:
Only special type of resistors (example: cement, metal film, etc) and capacitors (example: electrolytic, tantalum, mylar, temp. coeff. capacitors) are detailed in the PARTS LIST. For the value of all common type components, refer to the schematic diagram of the P.C. board illustration. Resistors not otherwise detailed are carbon type (1/4W or 1/8W). Order carbon resistors and capacitors according to the following example

A carbon resistor's part number is BD14BY 2E222J.

A carbon resistor's part number is RD14BY 2E222J.

A ceramic capacitor's number is CK45F1H103Z, CC45TH1H220J

RESISTOR

1. Type of the carbon resistor



RD14BY
RD14BB (small size)



RD14CY
RD14CB (small size)

2. Wattage

$$\begin{array}{lll} 1W \rightarrow 3A & 3W \rightarrow 3F & 5W \rightarrow 3H \\ 2W \rightarrow 3D & 4W \rightarrow 3G & \end{array}$$

3' = CC45 ○○...

Ceramic capacitor (type I) temperature coeff. capacitor 1' 3'

1st word (Color)	C (Black)	L (Red)	P (Orange)	R (Yellow)	S (Green)	T (Blue)	U (Violet)
ppm/°C	0	-80	-150	-220	-330	-470	-750

3 = CK45 Q

Ceramic capacitor (type II) 3

Cord	B	D	E	F
Operating temperature	-30	-30	-30	-10
°C	+85	+85	+85	+70

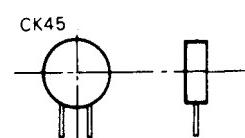
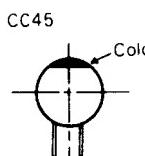
6 = Tolerance

Cord	C	D	G	J	K	M	X	Z	P	
(%)	± 0.25	± 0.5	± 2	± 5	± 10	± 20	± 40 -20	± 80 -20	± 100 -0	More than $10 \mu F$ $-10 \sim +50$ Less than $4.7 \mu F$ $-10 \sim +75$

Less than 10 pF

Cord	B	C	D	F	G
(-5)	+0.1	+0.25	+0.5	+1	+2

Abbreviation		Abbreviation	
Cap.	Capacitor	ML	Mylar
C	Ceramic	S	Styren
E	Electrolytic	T	Tantalum
MC	Mica		



TR-7730 SEMICONDUCTOR

★ · New parts

Item	Name	Re-marks	Parts No.	Item	Name	Re-marks	Parts No.
Diode	1N60		V11-0051-05	Zener diode	WZ-040		V11-4102-50
	1S1555		V11-0076-05		XZ-060		V11-4101-20
	1S2588		V11-0414-05		XZ-070		V11-4161-96
	1SS99		V11-1277-86		XZ-090		V11-4167-06
	BA243S		V11-7767-06		XZ-100		V11-4104-10
	MA522 (Q)		V11-1173-46	LED	LN233RP		V11-1173-06 Red
	M1303		V11-5273-66		LN333GP		V11-1173-16 Green
	M1402		V11-5260-16		LN433YP		V11-1173-26 Amber
	U05B		V11-0270-05		LN543RK		V11-1173-36 4 Digit
Vari-Cap	1S2208		V11-0317-05	Thermistor	D33A		V11-3161-86
Varistor	1S1212		V11-1262-06				

TR-7730

PARTS LIST

Item	Name	Re-marks	Parts No.	Ref. No.	Parts No.	Re-marks	Description
TR	2SA562TM (Y)		V01-0562-16		B07-0636-04	☆	Side escutcheon x 2
	2SA1015 (Y)		V01-1015-06		B10-0629-04		Front glass
	2SA1115 (E)		V01-1115-16		B40-2571-04	☆	Model name plate K, M
	2SC458 (B)		V03-0093-05		B40-2572-04	☆	Model name plate T
	2SC460 (B)		V03-0079-05		B40-2573-04	☆	Model name plate W
	2SC496 (Y)		V03-0336-05		B46-0058-10		Warranty card K
	2SC1775 (E)		V03-1775-06		B50-3911-00	☆	Operating manual K, M
	2SC1815 (Y)		V03-1815-06		B50-3912-00	☆	Operating manual T
	2SC1923 (O)		V03-1923-06		B50-3913-00	☆	Operating manual W
	2SC1959 (Y)		V03-1959-06		C101		C 47pF
	2SC2240 (GR)		V03-2240-06		C102, 103		Laminated cap. 0.047μF
	2SC2538		V03-2538-06		C104~113		Cap. 0.001μF
	2SC2603 (E)		V03-2603-06		C115, 118, 119		C 47pF
	2SK19 (GR) TRIO-5		V09-1001-16		CC45SL1H470J		
	2SK30A (O)		V09-0056-05		C91-0430-05		
FET	3SK74 (L)		V09-1002-56		C91-0469-05		
	3SK76		V09-1012-06		CC45SL1H470J		
	3SK92		V09-1006-16				
Power module	VP-15E1305	☆	V30-1240-26		E06-0651-05		6P male socket MIC
	HA1366W		V30-1045-06		E07-0651-05		6P metal plug MIC
IC	NJM78L06K		V30-1067-06		E12-0001-05		Phone plug (accessory)
	TA7061AP		V30-0039-05		E30-1689-05	☆	DC cord (C) (accessory)
	TA7302P		V30-1134-06		E31-2074-15		Connector with lead (B)
	TA7612AP		V30-1169-06		F05-6021-05		Fuse 6A (accessory)
	TC4011BP		V30-0301-70		G02-0518-04		
	TC4042BP		V30-1052-06		G10-0607-04		Gnd spring (C) x 2 Helical
	TC5022BP		V30-1054-06		G10-0611-04		Cushion cloth x 4 120 x 4 mm
	TC5081P		V30-1132-06		G10-0612-04		Cushion cloth (B) 30 x 13 mm
	TC5082P-GL		V30-1147-06		G10-0613-14		Cushion cloth (C) 150 x 45 mm
	TC7404UBP		V30-1028-06		G10-0615-04		Cushion cloth (D) 140 x 24 mm
	TC9122P		V30-1036-16		G13-0638-04		Cushion cloth (E) x 2
	μPC78L08A		V30-1030-26		G16-0503-03		73 x 15mm Case
	μPC78M08H		V30-1222-16		H01-2760-03	☆	Cushion (A) x 2 53 x 24 x 5 mm
	μPD650C-078		V30-1219-16		H01-2761-03	☆	Conductive rubber sheet
Micro-processor	J02-0022-05				H10-2536-04	☆	
	J02-0420-04				H10-2551-02	☆	
	J21-2676-04				H12-0474-04	☆	
	J25-2715-04				H20-1417-03	☆	
	J25-2744-04				H25-0029-04	☆	
	J25-2755-14				H25-0049-03	☆	
	J25-2756-04				H25-0079-04	☆	
	J25-2757-14				H25-0103-04	☆	
	J25-2758-14				J02-0022-05		Foot x 2 (accessory) Rear
	J32-0748-04				J02-0420-04		Foot (accessory) Front
	K21-0752-03				J21-2676-04		Foot mounting hardware x 2 (accessory)
TR-7730 GENERAL	K23-0736-04				J25-2715-04		PC board M, CH
	K23-0737-04				J25-2744-04		PC board (E) RPT
	K23-0743-04				J25-2755-14		PC board (A) Schmitt
	K27-0416-05				J25-2756-04		PC board (B) 10k/5k, H/L
	K27-0417-05				J25-2757-14		PC board (C) M/MR, M/S/TONE
	K27-0418-05				J25-2758-14		PC board (D) SCAN, HOLD
					J32-0748-04		Boss x 4 (accessory)
					K21-0752-03		Main knob
					K23-0736-04		Knob (A) x 2 VOL, SQU
					K23-0737-04		Knob (B) M, CH
					K23-0743-04		Knob (C) RPT
					K27-0416-05		Push knob (A) M
					K27-0417-05		Push knob (B) MR
					K27-0418-05		Push knob (C) x 3 10k/5k, H/L, TONE

Ref. No.	Parts No.	Re-marks	Description
TR-7730 GENERAL			
	A01-0905-03	☆	Case (upper)
	A01-0906-03	☆	Case (lower)
	A13-0618-22		Angle ass'y (accessory)
	A20-2433-04	☆	Panel
	B01-0639-03	☆	Panel escutcheon K, M
	B01-0640-03	☆	Panel escutcheon T
	B01-0641-03	☆	Panel escutcheon W
	B03-0517-04		Switch mask x 2 M, MR
	B03-0518-04		Switch mask x 4 5k/10k, H/L, TONE, MS
	B05-0714-04		SP grill cloth

PARTS LIST

Ref. No.	Parts No.	Re-marks	Description	Ref. No.	Parts No.	Re-marks	Description
	K27-0419-05		Push knob (D) MS	C25	C91-0131-05	C	0.01μF
	K27-0420-04		Push knob (E) x 2 SCAN, HOLD	C26	CC45CH1H050C	C	5pF ±0.25pF
	N09-0008-04		Round screw x 4 Angle (accessory)	C30	CC45SL1H151J	C	150pF
	N13-0302-04		Ornamental nut M. CH	C32	CC45CH1H150J	C	15pF
	N14-0510-04		Flange nut x 4 Angle (accessory)	C33	CQ92M1H393K	ML	0.039μF 50V
	N14-0512-05		Speed nut x 3	C34	CQ92M1H223K	ML	0.022μF 50V
	N15-1020-46		Flat washer x 2	C35	CE04W1A101M	E	100μF 10V
	N15-1060-46		Flat washer x 4 .Angle (accessory)	C36, 37	CQ92M1H473K	ML	0.047μF 50V
	N16-0060-46		Spring washer x 4 Angle (accessory)	C38	CQ92M1H393K	ML	0.039μF 50V
	N30-2004-46		Round screw x 20	C39	CQ92M1H103K	ML	0.01μF 50V
	N30-2020-46		Round screw	C41~43	CQ92M1H223K	ML	0.022μF 50V
	N30-2604-46		Round screw x 23	C47	CC45SL1H470J	C	47pF
	N30-3004-46		Round screw x 5	C50, 53	CQ92M1H222K	ML	0.0022μF 50V
	N30-3006-46		Round screw	C54	CQ92M1H473K	ML	0.047μF 50V
	N32-2604-46		Flat screw x 7	C55	CQ92M1H102K	ML	0.001μF 50V
	N32-2606-45		Flat screw x 4	C56	CQ92M1H223K	ML	0.022μF 50V
	N33-2605-45		Round flat screw x 13	C57	CQ92M1H222K	ML	0.0022μF 50V
	N33-2606-45		Round flat screw x 10	C58	CQ92M1H332K	ML	0.0033μF 50V
	N35-3006-45		Bind screw x 6 (accessory)	C59	CQ92M1H222K	ML	0.0022μF 50V
	N35-3012-45		Bind screw x 4 (accessory)	C60	CQ92M1H393K	ML	0.039μF 50V
VR101	R05-3410-15		Pot. 10kΩ (A) with SW VOL	C61, 62	CQ92M1H223K	ML	0.022μF 50V
VR102	R05-4405-05		Pot. 50kΩ (B) SQU	C63	CE04W1A470M	E	47μF 10V
	S01-1421-05		Rotary switch RPT	C64	CS15E1A220M	T	22μF 10V
	S01-1422-05		Rotary switch M. CH	C65	CQ92M1H103K	ML	0.01μF 50V
	S40-1401-05		Push switch x 2 MS, H/L	C66	CQ92M1H392K	ML	0.0039μF 50V
	S40-1402-05		Push switch M	C67	CS15E1V0R1M	T	0.1μF 35V
	S40-2417-05		Push switch x 2 10k/5k, MR	C68	CC45CH1H220J	C	22pF
	S40-2417-05		Push switch TONE K, M, T	C69	CQ92M1H103K	ML	0.01μF 50V
	S40-2421-05		Push switch TONE W	C70	CC45CH1H220J	C	22pF
	S50-1406-05		Tact switch x 2	C71	CS15E1A100M	T	10μF 10V
	S59-1405-05		Key board switch x 2 SCAN, HOLD	C72	CQ92M1H332K	ML	0.0033μF 50V
	T07-0216-05		Speaker	C73, 74	CS15E1C3R3M	T	3.3μF 16V
	T91-0311-05		Microphone	C75	CS15E1C4R7M	T	4.7μF 16V
	T91-0313-05		Microphone	C78	CS15E1V0R1M	T	0.1μF 35V
	W02-0316-05		Rotary encoder	C79	CE04W1A330M	E	33μF 10V
	X44-1450-10	☆	RX.TX unit	C81	CS15E1V0R1M	T	0.1μF 35V
	X44-1450-51	☆	RX.TX unit	C82	CE04W1A220M	E	22μF 10V
	X44-1450-61	☆	RX.TX unit	C83	CS15E1C4R7M	T	4.7μF 16V
	X45-1190-10	☆	Final unit	C84	CE04W1A330M	E	33μF 10V
	X50-1750-10	☆	PLL unit	C85	CE04W1H010M	E	1μF 50V
	X53-1230-10	☆	Control unit	C86	CQ92M1H103K	ML	0.01μF 50V
	X53-1230-61	☆	Control unit	C88	CQ92M1H473K	ML	0.047μF 50V
	X54-1520-11		Display unit	C89	C91-0131-05	C	0.01μF
RX.TX UNIT (X44-1450-10, -51, -61) -10 : K, M -51 : T -61 : W				C90	CE04W1H010M	E	1μF 50V
C1	CC45CH1H220J		C 22pF	C91	CQ92M1H332K	ML	0.0033μF 50V
C4, 5, 7	C91-0131-05		C 0.01μF	C92	CE04W1A101M	E	100μF 10V
C8	CC45CH1H060D		C 6pF ±0.5pF	C93	CE04W1A470M	E	47μF 10V
C11	CE04W1C100M		E 10μF 16V	C94	CQ92M1H102K	ML	0.001μF 50V
C13	CC45CH1H220J		C 22pF	C95	CC45SL1H101J	C	100pF
C16	CC45SL1H101J		C 100pF	C96	CE04W1A470M	E	47μF 10V
C19	C91-0131-05		C 0.01μF	C97	CE04W1A101M	E	100μF 10V
C20	CC45CH1H180J		C 18pF	C98	CQ92M1H104K	ML	0.1μF 50V
C21	CC45CH1H050C		C 5pF ±0.25pF	C99	CE04W1H010M	E	1μF 50V
C22	CC45CH1H220J		C 22pF	C100, 101, 103	CE04W1A470M	E	47μF 10V
C23	CC45CH1H0R5C		C 0.5pF ±0.25pF	C105, 106	C90-0820-05	E	470μF 16V

TR-7730

PARTS LIST

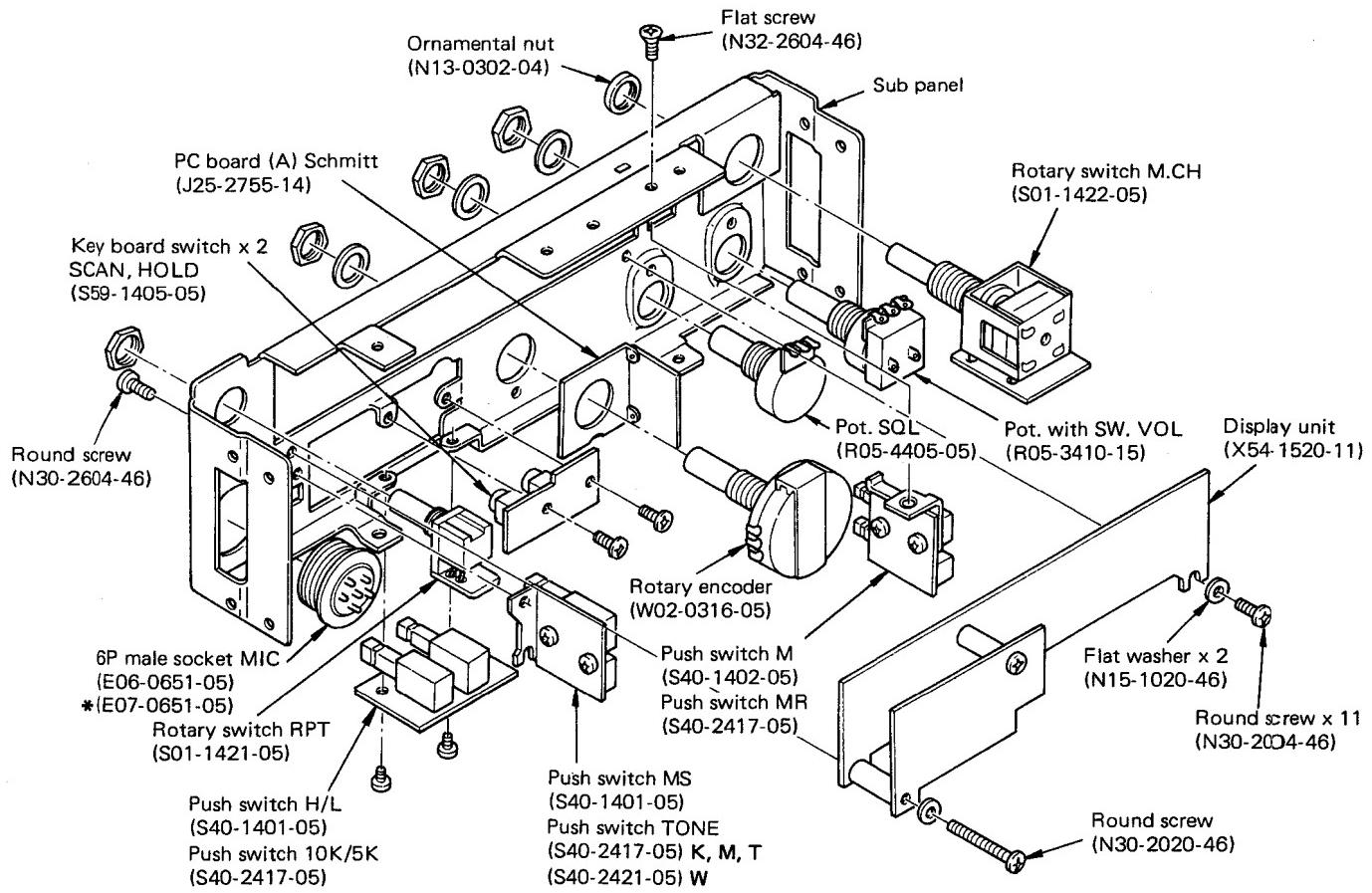
Ref. No.	Parts No.	Re-marks	Description				Ref. No.	Parts No.	Re-marks	Description				
C129	CS15E1A150M		T	15μF	10V	T	C10	C91-0466-05		Cap.	0.001μF			
C130	C91-0131-05		C	0.01μF			C11	CC45SL2H330J		C	33pF	500V		
C131	CS15E1A150M		T	15μF	10V	T	C12	CC45CH1H0R5C		C	0.5pF	±0.25pF		
C132	CE04W1HR47M		E	0.47μF	50V		C13	CC45CH1H030C		C	3pF	±0.25pF		
C139~141	C91-0131-05		C	0.01μF			C14	CC45SL2H330J		C	33pF	500V		
TC1	C05-0030-15		Ceramic trimmer 20pF				C15	CC45SL2H100D		C	10pF	±0.5pF	500V	
	E23-0046-04		Square terminal x 3				C16	CC45CH1H0R5C		C	0.5pF	±0.25pF		
J1~5	E40-0273-05		Mini connect wafer 2P				C17	CC45SL2H220J		C	22pF	500V		
J6	E40-0673-05		Mini connect wafer 6P				C19	C91-0131-05		C	0.01μF			
J7	E40-0773-05		Mini connect wafer 7P				C21	CC45SL2H150J		C	15pF	500V		
J8	E40-0273-05		Mini connect wafer 2P				C30, 31	CC45SL1H101J		C	100pF			
J9	E40-1173-05		Mini connect wafer 11P				C35	CE04W1C221M		E	220μF	16V		
J10	E40-0873-05		Mini connect wafer 8P				J1	E31-2093-05		★	Coax. connector with 2P lead			
J11	E40-0673-05		Mini connect wafer 6P				J2	E40-0373-05		★	Mini connect wafer 3P			
J12	E40-0273-05		Mini connect wafer 2P				J3	E31-2093-05		★	Coax. connector with 2P lead			
L1	L33-0002-05		Choke coil 1μH				J4	E04-0152-05		★	UHF type receptacle			
L2	L34-0948-05		Tuning coil				J5	E11-0403-05		★	Phone jack			
L3	L34-0452-05		VHF coil 3φ 6T				J6	E08-0304-05		★	Power jack Backup			
L4	L34-0691-05		VHF coil 5φ 5T				J7	E40-0373-05		★	Mini connect wafer 3P			
L5	L79-0482-05	★	Helical resonator (A) 4 MHz 2pole				E23-0046-04			★	Square terminal x 6			
L6	L79-0483-05	★	Helical resonator (B) 4 MHz 3pole				E30-1688-05			★	DC cord (D) with 6A Fuse			
L7, 8	L30-0281-05		IFT 10.7 MHz				F01-0760-05			★	Heat sink			
L10	L30-0504-05		IFT 455 kHz				F05-6021-05			★	Fuse 6A			
L11	L30-0503-05		IFT 455 kHz				J41-0006-05			Cord bushing DC cord				
L12	L40-6825-04		Ferri-inductor 6.8mH				L1	L34-0951-05			Coil (A) 4φ 2.5T			
L13	L40-1021-03		Ferri-inductor 1mH				L2	L34-0438-05			Coil 0.94μH			
L14	L40-1541-27		Ferri-inductor 150mH				L3	L34-0952-05			Coil (B) 4φ 5.5T			
L15	L15-0016-05		Choke trans.				L4, 5	L34-0953-05			Coil (C) 4φ 3.5T			
L16	L40-1511-03		Ferri-inductor 150μH				L6	L33-0025-05			Choke coil 1μH			
L17 (A), (B)	L71-0219-05		MCF 10.7 MHz				L7	L39-0409-05			Detector coil			
L18	L72-0315-05		Ceramic filter CFW455F				L8	L33-0002-05			Choke coil 1μH			
L19	L79-0446-05		Ceramic discri CFY455S				L9	L34-0955-15			Coil (E) 4φ 3.5T			
L20	L34-0683-05		Tuning coil				L10	L33-0074-05			Heater choke			
X1	L77-0327-05		Crystal 10.245 MHz				L11	L33-0002-05			Choke coil 1μH			
	N30-3008-11		Round screw x 2 IC							Round screw x 7				
R96	R92-0616-05		Metal film 10kΩ ±1% 1/4W					N30-2604-11			Round screw x 2 Back up			
R101	RC05GF2H5R6J		Solid 5.6Ω 1/2W					N30-2606-11			Bind screw x 2 Module			
R107	R92-0616-05		Metal film 10kΩ ±1% 1/4W					N35-3006-46			Metal film 1Ω			
R108	RN14BK2E4703F		Metal film 470kΩ ±1% 1/4W								Trim. pot 100kΩ (B)			
R126	R92-0617-05		Metal film 7.5kΩ ±1% 1/4W								Trim. pot 500Ω (B)			
VR1	R12-4016-05		Trim. pot 50kΩ (B)								PLL UNIT (X50-1750-10)			
VR2	R12-1020-05		Trim. pot 1kΩ (B)											
VR3	R12-1414-05		Trim. pot 1kΩ (B)											
VR4	R12-1020-05		Trim. pot 1kΩ (B)											
VR5~7	R12-1405-05		Trim. pot 3kΩ (B)											
VR8	R12-4403-05		Trim. pot 50kΩ T											
VR9	R12-2409-05		Trim. pot 5kΩ W, T											
	R92-0150-05		Short jumper											
FINAL UNIT (X45-1190-10)														
C3	CE04W1C101M		E	100μF	16V		C3	CC45CH1H0R5C		C	0.5pF	±0.25pF		
C4, 5	CC45SL2H070D		C	7pF	±0.5pF	500V	C4	CC45TH1H080D		C	8pF	±0.5pF		
C7, 8	CC45SL2H101J		C	100pF	500V		C5	CC45CH1H020C		C	2pF	±0.25pF		
C9	CC45CH1H150J		C	15pF			C6	CC45CH1H050C		C	5pF	±0.25pF		
							C7	CE04W1A220M		E	22μF	10V		
							C11	CC45CH1H070D		C	7pF	±0.5pF		
							C12	CC45CH1H030C		C	3pF	±0.25pF		
							C13	CC45CH1H050C		C	5pF	±0.25pF		
							C14	CE04W1A101M		E	100μF	10V		
							C16	CC45CH1H040C		C	4pF	±0.25pF		
							C17	CC45CH1H010C		C	1pF	±0.25pF		
							C20	CC45CH1H220J		C	22pF			
							C22	C91-0131-05		C	0.01μF			

PARTS LIST

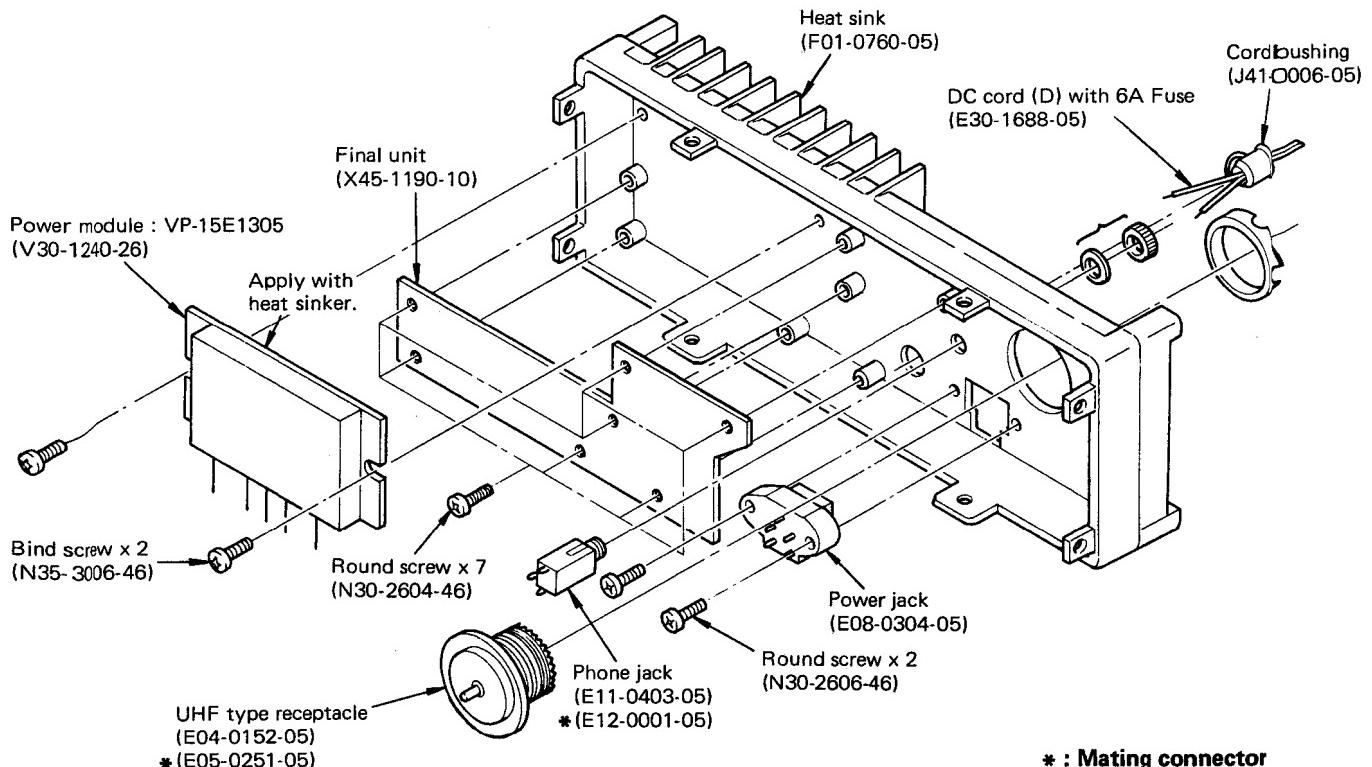
Ref. No.	Parts No.	Re-marks	Description		
C24	CE04W1H3R3M		E 3.3μF	50V	
C26	CC45RH1H020C		C 2pF	±0.25pF	
C27	CC45RH1H040C		C 4pF	±0.25pF	
C29	CC45CH1H020C		C 2pF	±0.25pF	
C32	C91-0131-05		C 0.01μF		
C34	CC45RH1H020C		C 2pF	±0.25pF	
C35	CC45RH1H030C		C 3pF	±0.25pF	
C36, 37	CC45CH1H040C		C 4pF	±0.25pF	
C38	CC45RH1H050C		C 5pF	±0.25pF	
C40	CC45RH1H040C		C 4pF	±0.25pF	
C41	C91-0131-05		C 0.01μF		
C42	CC45CH1H390J		C 39pF		
C43	CC45CH1H330J		C 33pF		
C44, 46	C91-0131-05		C 0.01μF		
C47	CE04W1A101M		E 100μF	10V	
C48	CE04W1A470M		E 47μF	10V	
C50	CQ92M1H473K	ML	0.047μF		
C51, 52	CS15E1C100M	T	10μF	16V	
C53	CS15E1V0R1M	T	0.1μF	35V	
C54	CE04W1A101M	E	100μF	10V	
C55	CQ92M1H223K	ML	0.022μF		
C57	CE04W1A101M	E	100μF	10V	
C58	CC45CH1H220J	C	22pF		
C59	CC45CH1H270J	C	27pF		
C60	CQ92M1H333K	ML	0.033μF		
C61	CC45SL1H101J	C	100pF		
C62	CQ92M1H153K	ML	0.015μF		
C63	CC45SL1H101J	C	100pF		
C64, 65	CC45CH1H100D	C	10pF	±0.5pF	
C69	CS15E1VR22M	T	0.22μF	35V	
C70	CC45CH1H020C	C	2pF	±0.25pF	
C72, 73	CC45CH1H330J	C	33pF		
TC1	C05-0062-05		Ceramic trimmer 6pF		
TC2	C05-0308-05		Ceramic trimmer 4pF		
TC3, 4	C05-0309-05		Ceramic trimmer 40pF		
J1	E23-0046-04		Square terminal x 4		
J1	E40-0273-05		Mini connect wafer 2P		
J2	E40-0473-05		Mini connect wafer 4P		
J3	E40-0673-05		Mini connect wafer 6P		
J4	E40-0773-05		Mini connect wafer 7P		
J5	E40-0673-05		Mini connect wafer 6P		
L1	L32-0632-05		OSC coil		
L2	L33-0637-05		Choke coil 3μH		
L3	L40-6811-03		Ferri-inductor 680μH		
L4	L40-3391-03		Ferri-inductor 3.3μH		
L5	L34-0956-05		Tuning coil		
L6	L40-2211-03		Ferri-inductor 220μH		
L7	L34-0956-05		Tuning coil		
L8	L40-2211-03		Ferri-inductor 220μH		
L9	L40-1511-03		Ferri-inductor 150μH		
L10	L31-0343-05		Tuning coil		
L11	L40-2211-03		Ferri-inductor 220μH		
L12	L40-1511-03		Ferri-inductor 150μH		
L13, 14	L32-0637-05		OSC coil		
L15	L40-2211-03		Ferri-inductor 220μH		
L16	L40-4711-03		Ferri-inductor 470μH		
L17	L40-1021-03		Ferri-inductor 1mH		
L18	L40-4711-03		Ferri-inductor 470μH		
L19	L40-2201-03		Ferri-inductor 22μH		
L20, 21	L40-1001-03		Ferri-inductor 10μH		

Ref. No.	Parts No.	Re-marks	Description		
X1	L77-0944-05	☆	Crystal R 42.6000 MHz		
X2	L77-0945-05	☆	Crystal T 46.1667 MHz		
X3	L77-0720-05		Crystal 10.240 MHz		
	R92-0150-05		Short jumper		
CONTROL UNIT (X53-1230-10, -61) -10 : K, M -61 : T, W					
C1	CE02W0J470		E 47μF	6.3V	
C2	CC45SL1H470J	C	47pF		
C3	CQ92M1H223K	ML	0.022μF		
C4	CE04W1H010M	E	1μF	50V	
C5~8	CS15E1VR22M	T	0.22μF	35V	
C9	CE04W1C220M	E	22μF	16V	
C10, 11	CE04W0J471M	E	470μF	6.3V	
C12	CE04W1H2R2M	E	2.2μF	50V	
C13	CE04W1A470M	E	47μF	10V	
C14	CE04W1C470M	E	47μF	16V	
C15	C91-0131-05	C	0.01μF		
C17	C90-0827-05	E	330μF	16V	
C18	C91-0131-05	C	0.01μF		
C19	CE04W1A101M	E	100μF	10V	
C20	CC45SL1H470J	C	47pF		
C24	CC45CH1H270J	C	27pF		
C25~28	CC45SL1H470J	C	47pF		
J1	E40-1173-05	☆	Connector with lead		
J2	E40-0473-05		Mini connect wafer 1P		
J3	E40-1073-05		Mini connect wafer 4P		
J4	E40-1273-05		Mini connect wafer 1OP		
J5	E40-0373-05		Mini connect wafer 12P		
J6	E40-1373-05		Mini connect wafer 3P		
J7	E40-0273-05		Mini connect wafer 13P		
J8	E40-0573-05		Mini connect wafer 2P		
			W, T		
J31	J31-0503-05	☆	Bead x 8		
J32	J32-0755-04		Round boss x 2		
L1	L30-0503-05		IFT 455 kHz		
	N30-2606-46		Round screw x 4		
R10	R90-0526-05		Resistor block 27kΩ × 4		
R15, 49	R90-0520-05		Resistor block 47kΩ × 5		
DISPLAY UNIT (X54-1520-11)					
C2	B07-0629-03		LED case		
	B08-0302-04		Back board		
	CE04W1C100M	E	10μF	16V	
	E23-0426-05		Earth lug φ 2		
	J31-0515-14		Collar		
	N10-2020-46		Nut		
	N15-1020-46		Flat washer		
	N30-2020-46		Round screw		
	R92-0150-05		Short jumper		

DISASSEMBLY

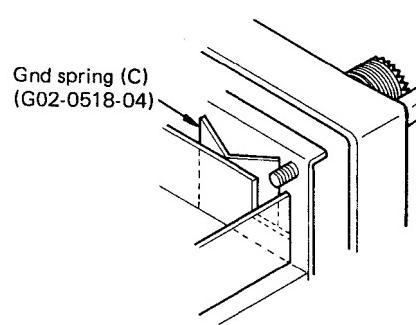
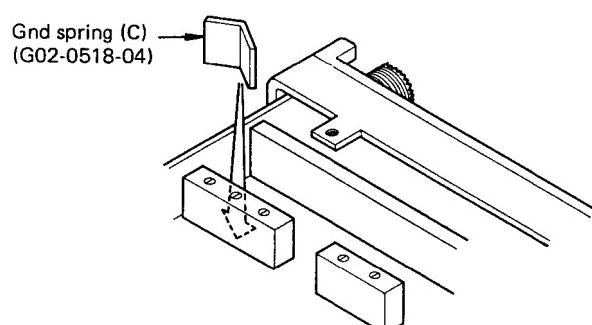
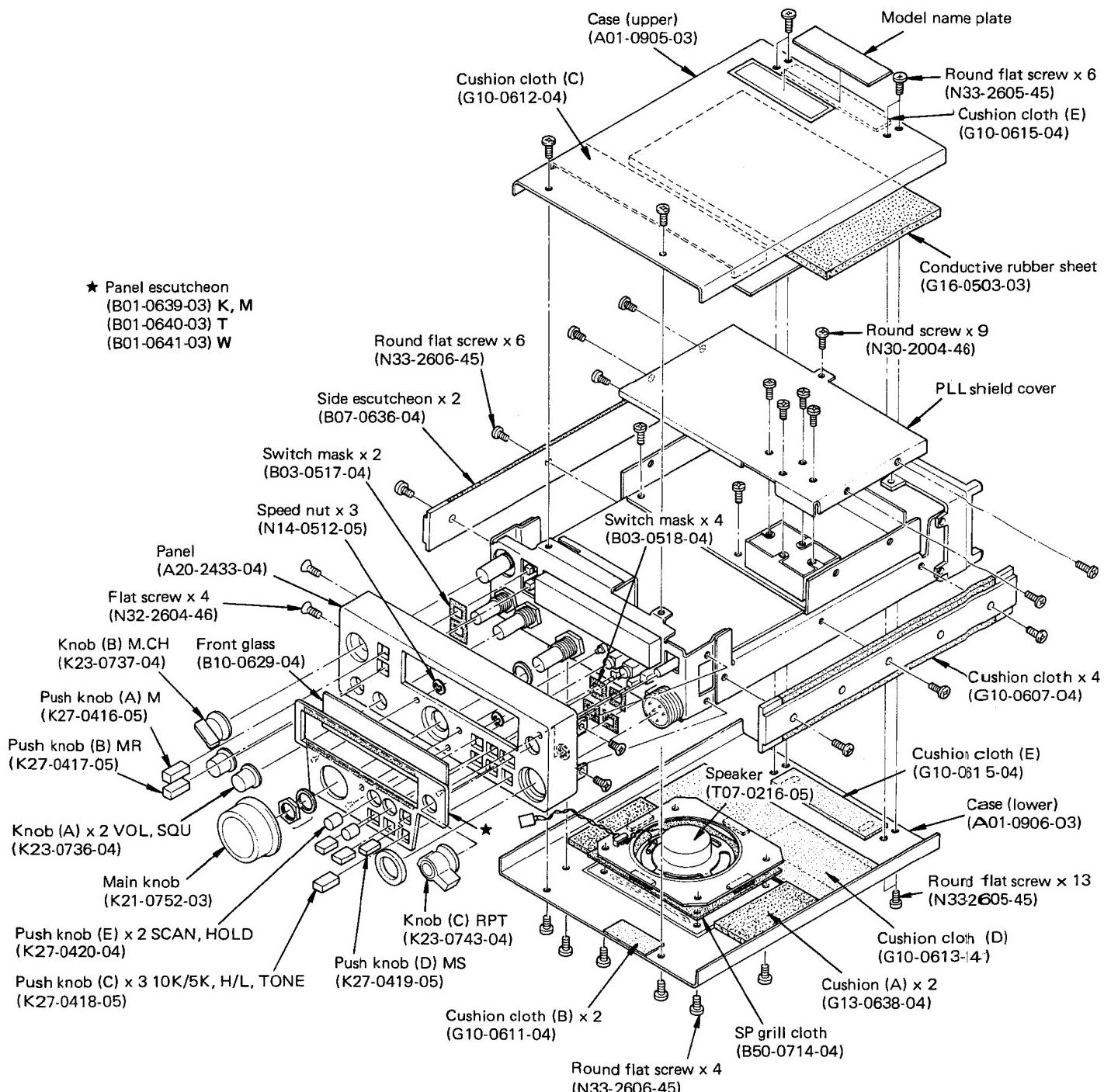


* : Mating connector



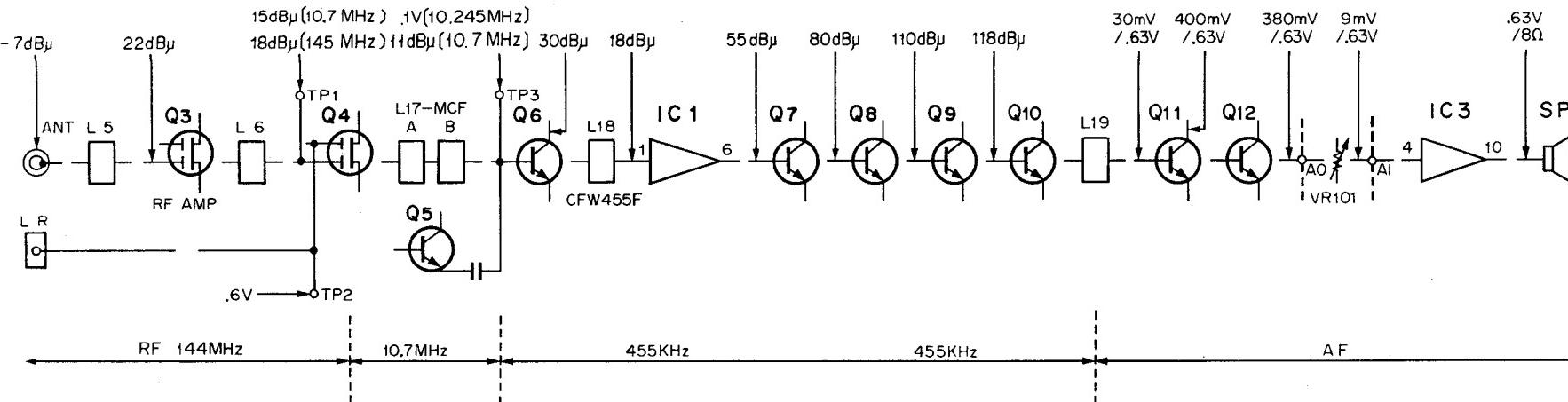
* : Mating connector

DISASSEMBLY



LEVEL DIAGRAM

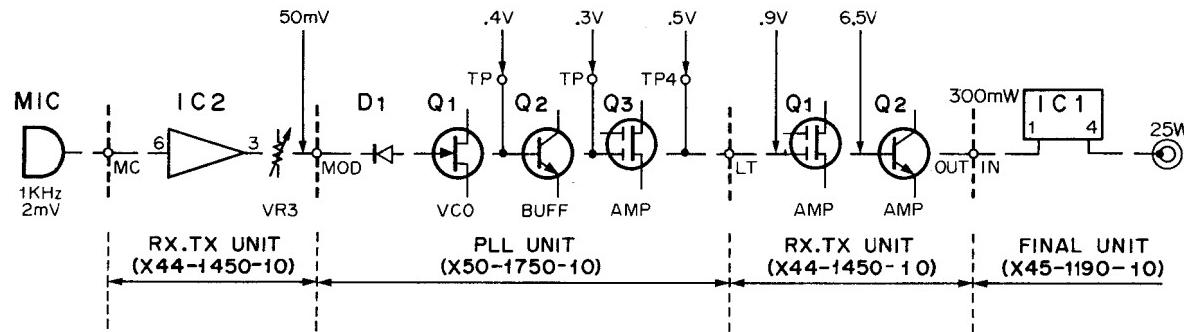
RECEIVER SECTION



- Notes : 1. To inject signal generator output connect a 0.01 μ F capacitor between the signal generator and the check point.
 2. In measuring the circuit from the ANT terminal to the base of Q10, unmodulated 144 MHz, 10.7 MHz, and 455 kHz signals from an SSG are applied to the check point to obtain a 20 dB NQ sensitivity.

3. In measuring the circuit from the base of Q11 to the SP terminal, an SSG signal of 144 MHz, 0 dB μ , 1 kHz MOD, 5 kHz DEV is applied to the ANT terminal, and the AF control is adjusted to obtain an AF output of 0.63 V/8 Ω . The signal voltage at each point is measured with an AF VTVM.

TRANSMITTER SECTION



- Notes : 1. Voltages in MIC AMP are measured by an AF VTVM with an input of 1 kHz, 2 mV.
 2. Voltage measurements before OUT terminal are read from an RF VTVM with OUT CABLE DISCONNECTED AT HI POWER POSITION.

< REFERENCE >

Japanese "SG"	American "SG"
-6 dB	0.25 μ V
0 dB	0.5 μ V
6 dB	1 μ V
12 dB	2 μ V
24 dB	8 μ V
30 dB	15.8 μ V
40 dB	50 μ V
50 dB	158 μ V
60 dB	500 μ V
70 dB	1.58 mV
80 dB	5 mV
90 dB	15.8 mV
100 dB	50 mV
120 dB	0.5 V

ADJUSTMENT

<Test Equipment>

1. Tester or DVM
 - Input: Sufficient
2. RF VTVM (RF V.M.)
 - Input impedance: 1 MΩ and less than 2 pF
 - Voltage range: F.S. = 10 mV to 300V
 - Frequency range: 150 MHz or greater
3. Frequency counter (*f* counter)
 - Minimum input voltage: 50 mV
 - Frequency range: 150 MHz or greater
4. DC power supply
 - Voltage 10V to 17V variable
 - Current: 8A min.
5. RF Power Meter
 - Dissipation: 50W
 - Impedance: 50Ω
 - Frequency range: 144 MHz
6. AF VTVM (AF V.M.)
 - Input impedance: 1 MΩ or greater
 - Voltage range: F.S. = 1 mV to 30V
 - Frequency range: 50 Hz to 10 kHz
7. AF Generator (AG)
 - Frequency range: 100 Hz to 10 kHz
 - Output: 0.5 mV to 1V
8. Linear detector
 - Frequency range: 144 MHz
9. Directional coupler
10. Oscilloscope
 - With horizontal input and high sensitivity
11. Standard signal generator (SSG)
 - Frequency range: 144 ~ 149 MHz
 - Modulation: amplitude and frequency modulation
 - Output: -20 dB ~ 100 dB
12. AF Dummy load
 - 8Ω, 5W (approx.)
13. Sweep generator
 - Frequency range: 144 ~ 149 MHz

<Preparation>

Unless otherwise specified, set the controls as follows.

POWER / VOL SW	ON
SEND / REC	REC
SQUELCH VOL	MIN
M. CH SW	1
M. SW	OFF
M.R SW	OFF
SCAN SW	OFF
HOLD SW	OFF
M.S SW	OFF
TONE	OFF
HI /LOW SW	HI
25k / 5k (W) (T)	25k
10k / 5k (K) (M)	5k

Notes:

- When adjusting the trimmers or coils, use a non-induced adjusting rod of bakelite, etc.
- When adjusting the RX section never transmit to prevent SSG damage.
- Connect MIC connector as shown in Fig. 11.

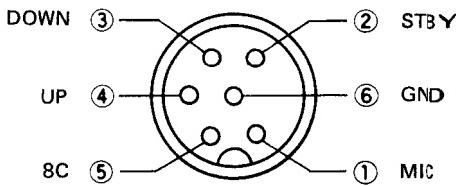


Fig. 11 MIC terminals (view from front panel side)

- The output level of SSG is indicated as SSG's open circuit.

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ADJUSTMENT

VOLTAGE CHECK

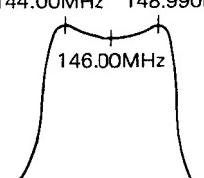
Item	Condition	Measuring point			Adjustment			Specifications	Remarks		
		Test equipment	Unit	Terminal	Unit	Part	Method				
1. Voltage check	1) Connect DC power (13.8V) to the radio.	DVM	RX.TX	8C				7.8~8.25V	Verify all voltage levels.		
				8R				7.8~8.25V			
				8T				0V			
				ST				13~13.8V			
	Control			Pin 21 of IC1				5.0~5.4V			
				Pin 16 of IC2				5.0~5.4V			
	2) POWER SW : OFF	Control	Pin 21 of IC1	RX.TX	VR4	5.2V	±0.2V				
				8T				9.3~9.7V	Verify voltages.		
	3) POWER SW : ON Transmit.		RX.TX	8R				0.5V or less			
	4) Return to receive.										

PLL ADJUSTMENT

Item	Condition	Measuring point			Adjustment			Specifications	Remarks					
		Test equipment	Unit	Terminal	Unit	Part	Method							
1. PLL (1)	1) Remove the PLL shield. f : 147.000 MHz Disconnect the coax. connector J2 from the RX. TX unit.	Oscillo-scope	PLL	R51 (Emitter of Q9)	PLL	L7, 10	Adjust for square wave.		 OK  NG					
2. PLL (2)	2)	RF V.M	PLL	TP4	PLL	L5	MAX	(0.4V)	() : reference value					
	1) f : 144.000 MHz Receive. --- Transmit. ---	f counter	PLL	TP4	PLL	L14	133.3000 MHz	±100 Hz						
						L13	144.0000 MHz							
						TC4	133.3050 MHz	±100 Hz						
						TC3	134.0050 MHz							
	2) f : 144.005 MHz Receive. --- Transmit. ---					L14	133.3000 MHz	±100 Hz	Check					
						L13	144.0000 MHz							
						TC1	1.9V	±0.01V						
						TC2	2.0V							
3. Lock voltage	1) f : 144.000 MHz Receive. --- Transmit. ---	DVM	PLL	TP1	PLL	TC1	1.9V	±0.01V	Check					
						TC2	2.0V							
	2) f : 148.990 MHz Receive. --- Transmit. ---							7V or less						
								6V or less						
4. Unlock voltage	1) Ground TP1 on the PLL unit. f : 145.000 MHz	DVM	PLL	ULB			Approx. 8V	Check 0.4V or less at locked state.						
5. Lock voltage check	1) Replace the PLL shield.	DVM	PLL	TP1	PLL	TC1	1.7V	±0.3V						
6. Frequency adjustment	1) f : 144.000 MHz Transmit. --- Receive. ---	f counter	PLL	TP4	PLL	L14	144.0000 MHz	±100 Hz						
						L13	133.3000 MHz							

ADJUSTMENT

RECEIVER ADJUSTMENT

Item	Condition	Measuring point			Adjustment			Specifications	Remarks
		Test equipment	Unit	Terminal	Unit	Part	Method		
1. Helical resonator	1) Disconnect the LR coax. connector J4 from the RX.TX unit. Connect the sweep generator output to the ANT terminal.		RX.TX	TP1	RX.TX	L5, 6	Adjust L5 and 6 to obtain the waveform shown at right.	144.00MHz 148.990MHz 	
	2) Reconnect the LR coax. connector on the RX.TX unit.								
2. Sensitivity	1) Connect a $100\mu\text{A}$ S meter to the M terminal on the RX.TX unit. Connect an AF V.M., oscilloscope and an 8Ω load to the EXT.SP terminal. Connect an SSG (MOD : 1 kHz, DEV : 5 kHz) to the ANT terminal.							(0.7V)	
	2) f : 145.000 MHz		RF V.M.	RX.TX	TP2	RX.TX PLL	L20 — L5		
	3) SQ VOL : Min. Receive the SSG signal.		External S meter	RX.TX	M	RX.TX	L7, 8		
	4) SSG output level : $40\text{dB}\mu$		AF V.M., Oscillo-scope	Rear panel	EXT. SP	RX.TX	L11		
	1) SSG output level : $15\text{dB}\mu$ Disconnect the external S meter from the M terminal.		S-indica-tor			RX.TX	VR1	Adjust VR1 so that the LED "8" indicator is lit.	
4. Squelch	1) SSG output level : $-10\text{dB}\mu$ Fine tune the SSG frequency so that the SSG signal is received at maximum strength.								
	2) f : 145.020 MHz Turn the squelch control until noise is gated.		BUSY-indicator					Must go off.	Check
			Squelch control setting					9 o'clock to 12 o'clock	
	3) f : 145.000 MHz		BUSY-indicator					Must be lit when the SSG signal is again received.	
	4) SQUELCH VR : Min.								
5. Sensitivity measurement	1) SSG output level : $-6\text{dB}\mu$ f : 145.000 MHz AF gain control setting : $0.63\text{V}/8\Omega$ Fine tune the SSG frequency to obtain the maximum AF V.M reading.	AF V.M.				< REFERENCE >		S/N 20 dB or more	Check
						Japanese "SG"	American "SG"		
						-6dB	$0.25\mu\text{V}$		
						0dB	$0.5\mu\text{V}$		
						6dB	$1\mu\text{V}$		
						12dB	$2\mu\text{V}$		
						24dB	$8\mu\text{V}$		
						30dB	$15.8\mu\text{V}$		
						40dB	$50\mu\text{V}$		
						50dB	$158\mu\text{V}$		
						60dB	$500\mu\text{V}$		
						70dB	1.58mV		
						80dB	5mV		
						90dB	15.8mV		
						100dB	50mV		
						120dB	0.5V		

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ADJUSTMENT

TRANSMITTER ADJUSTMENT

Item	Condition	Measuring point			Adjustment			Specifications	Remarks
		Test equipment	Unit	Terminal	Unit	Part	Method		
1. Setting	Connect the power meter to the ANT terminal. f : 146.000 MHz RX.TX unit, TC1 : centered RX.TX unit, VR6 : fully clockwise				Directional coupler				
		Power supply	A	ANT		Power meter			
					Linear detector	Oscilloscope			
				TR-7730		AF OUT			
2. Power and RF indicator adjustment	1) Transmit.	DC A.M., Power meter			RX.TX	L2 TC1	MAX	30W or more	
					RX.TX	VR6	29W		
	2) HI/LOW : LOW				RX.TX	VR5	5W		
	3) HI/LOW : HI				RX.TX	VR6	20W		
	4) RF indicator at high power	RF indicator			Final	VR1	Set VR1 so that LED "10" is lit.		
	5) HI/LOW : HI	Power meter			RX.TX	VR6	29W		
	6) RF indicator at low power	RF indicator						At least one of the LEDs should light.	Check
3. Protection	1) HI/LOW SW : HI	DVM	RX.TX	PRO	Final	VR2	Min.	(0.4V or less)	
	2) Disconnect the power meter from the ANT terminal.	DC A.M.			RX.TX	VR7	1.5A	±0.1A	Adjust as quickly as possible.
4. Power check	1) Adjust the power supply voltage to 13.8V. Connect the power meter to the ANT terminal. f : 144.000MHz 146.000 148.990	Power meter, DC A.M.						25W or more 5.5A or less	Check
	2) HI/LOW SW : LOW	Power meter, DC A.M.						0.8~1.5W 1.2A or less	
5. Modulation	1) HI/LOW SW : HI Connect the AG (20mV, 1kHz) to the MIC terminal.	Linear detector			RX.TX	VR3	5 kHz deviation	±0.3 kHz	
	2) AG output level : 2 mV, 1 kHz	Linear detector			RX.TX	VR2	3.5 kHz deviation	±0.3 kHz	
	3) Check for abnormal oscillation by varying the power supply voltage from 11.5V to 16V at any frequency.							There should be no abnormal oscillation.	
	4) Return to receive.								

ADJUSTMENT

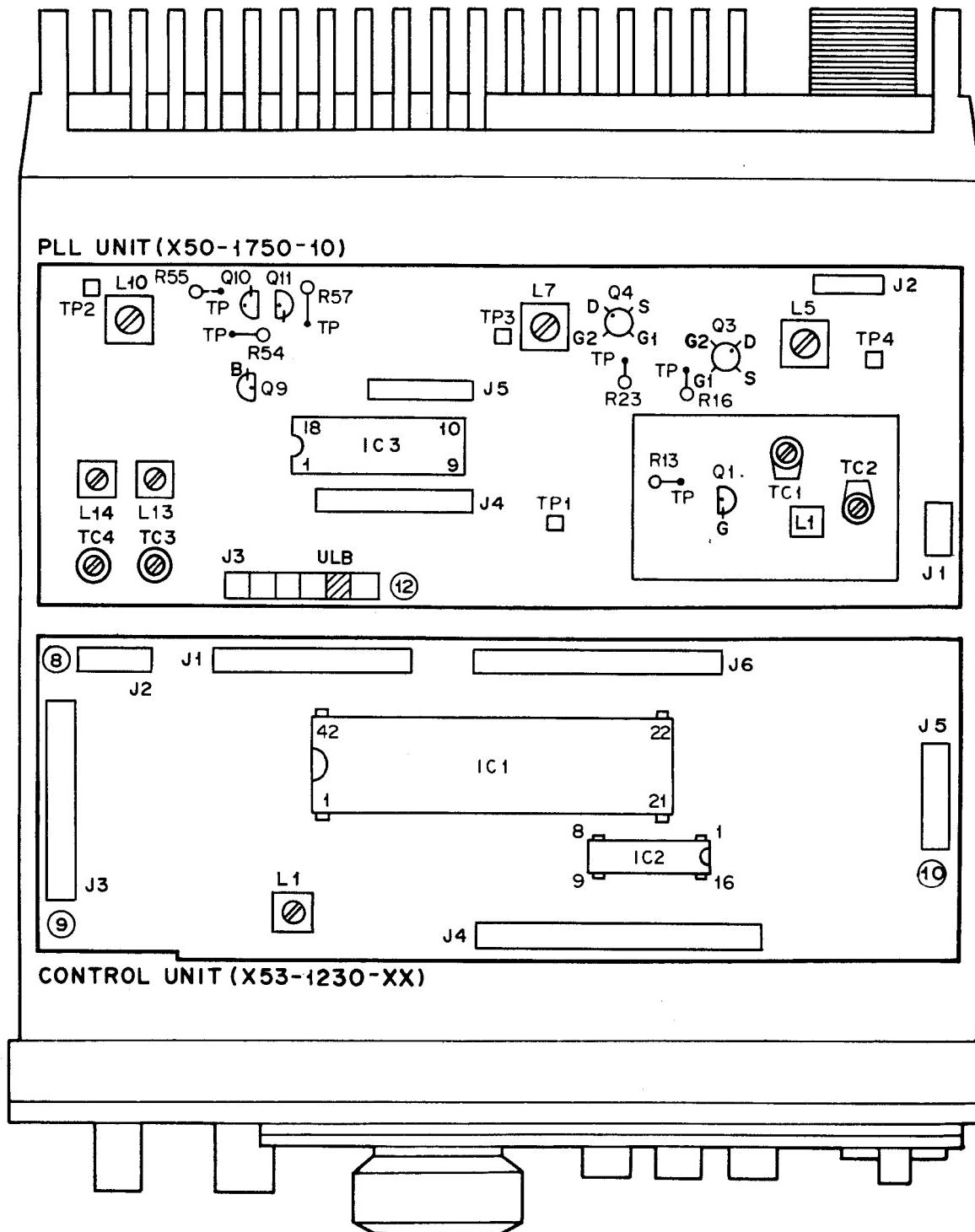
MICROPROCESSOR OPERATION CHECK

Item	Control functions	Microprocessor functions	Remarks
1.	1) Disconnect DC power. Reconnect after waiting 20 sec.	5.000 is displayed.	Reset operation check
2. Main dial	1) Turn the main dial. 2) 5K/10K SW : 10K, Turn the main dial.	Indication changes in 5 kHz increments. Indication changes in 10 kHz increments.	
3. UP/DOWN	1) Press the UP or DOWN switch once. 2) 5K/10K SW : 5K 2) Press and hold the UP or DOWN switch. 3) Press the UP and DOWN switch simultaneously.	When pressed, the frequency indication increases or decreases in 5 kHz increments. The frequency indication increases or decreases continuously. The frequency does not change.	The frequency indication changes in 10 kHz steps with 5K/10 kHz SW at 10K.
4. Memory entry	1) M.CH switch : 1~5 M.R switch : ON 2) M.R switch : OFF M.S switch : ON 3) M.S switch : OFF M.CH switch : 1~5 M switch : ON 4) M.CH switch : 5 Set the main dial in a position different from that set during step (3). Set in transmit mode and then press the M switch. 5) Return to receive.	4.000 is displayed. 4.000 is displayed. Pressing the M switch causes the displayed frequency to be stored in the selected memory corresponding to the M.CH switch setting. The displayed frequency is stored in the transmit frequency memory of memory 5.	In memory channel 5, the transmitting frequency is different from the receiving frequency.
5. Memory recall	1) M.CH switch : 1~5 M.R switch : ON 2) Turn the main dial. 3) UP/DOWN switch : ON 4) M.S switch : ON 5) SCAN switch : ON 6) M.S switch : OFF 7) M.CH switch : 5 Set in transmit. 8) Return to receive. M.R switch : OFF	Each frequency stored during step 4. (3) is displayed. The frequency displayed does not vary. The frequency stored during step 4. (4) is displayed.	M.R operation has priority.
6. SCAN	1) Squelch control : Max SCAN switch : ON 2) Press and hold the SCAN switch. 3) Squelch control : Min. 4) Squelch control : Max 5) Set in transmit. 6) Set in receive. SCAN switch : ON 7) HOLD switch : ON 8) SCAN switch : ON	The frequency increases in increments of 5 kHz. Scan speed becomes faster. BUSY indicator is lit and scan stops. Scan resumes. Scan stops.. Scan stops. Scan stops.	
7. Memory scan	1) M.S switch : ON 2) Squelch control : Min. 3) Squelch control : Max 4) Set in transmit. 5) Return to receive. SCAN switch : ON	Frequencies stored in the memory during step 4. (3) are scanned. BUSY indicator is lit and scan stops. Scan resumes. Scan stops. Scan resumes.	Memory scan has priority. Scanning order → 1 → 2 → 3 ↓ ← 4 ← 1~5 continuous.
8. Switch priority	1) M.R : ON 2) M.S : ON 3) SCAN, HOLD : ON 4) UP/DOWN : ON 5) Main dial 6) M : ON	Memory reading Memory scan Scanning operation UP/DOWN operation Main dial Memory entry	Priority 1st 2nd 3rd 4th 5th 6th

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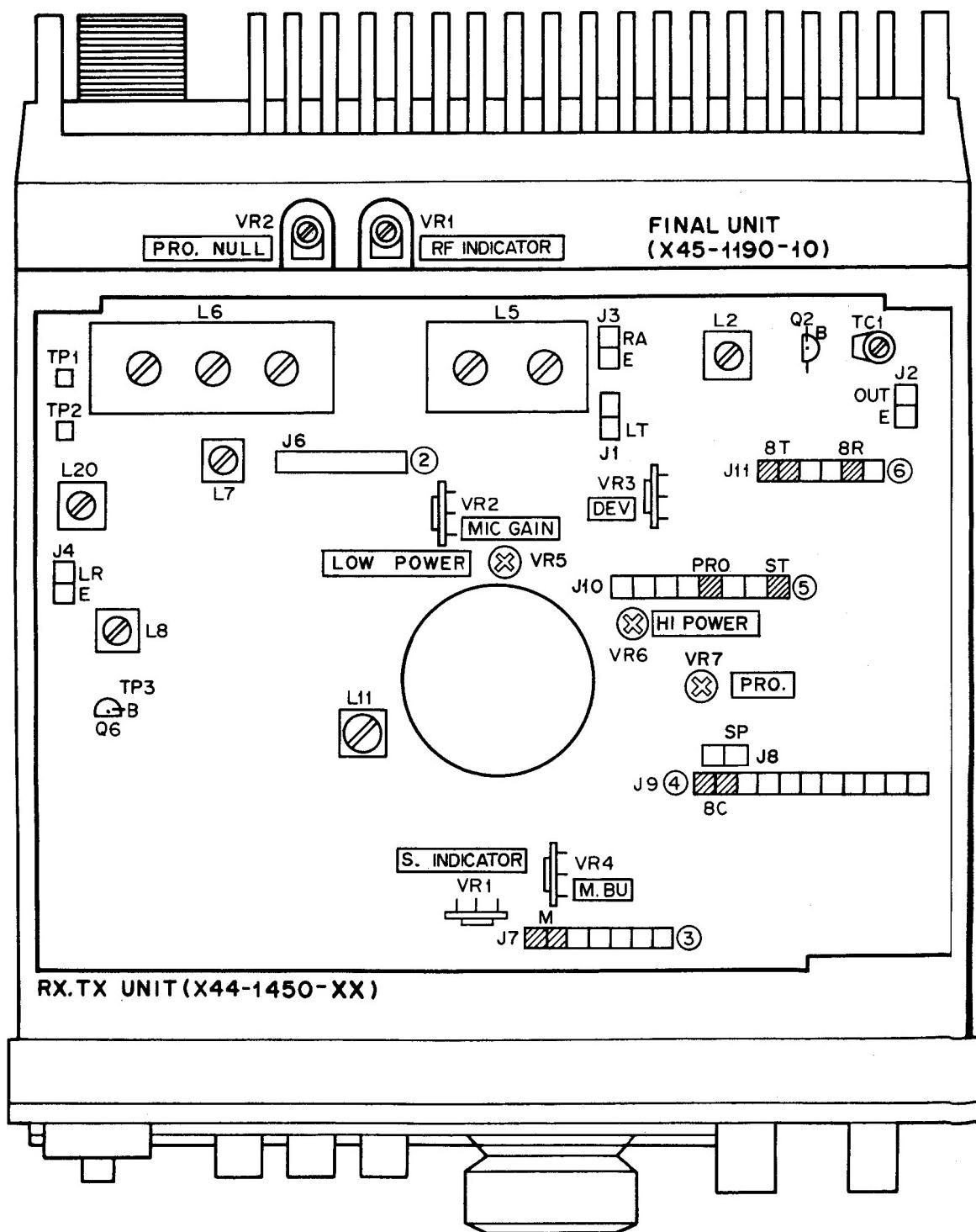
ADJUSTMENT

TOP VIEW



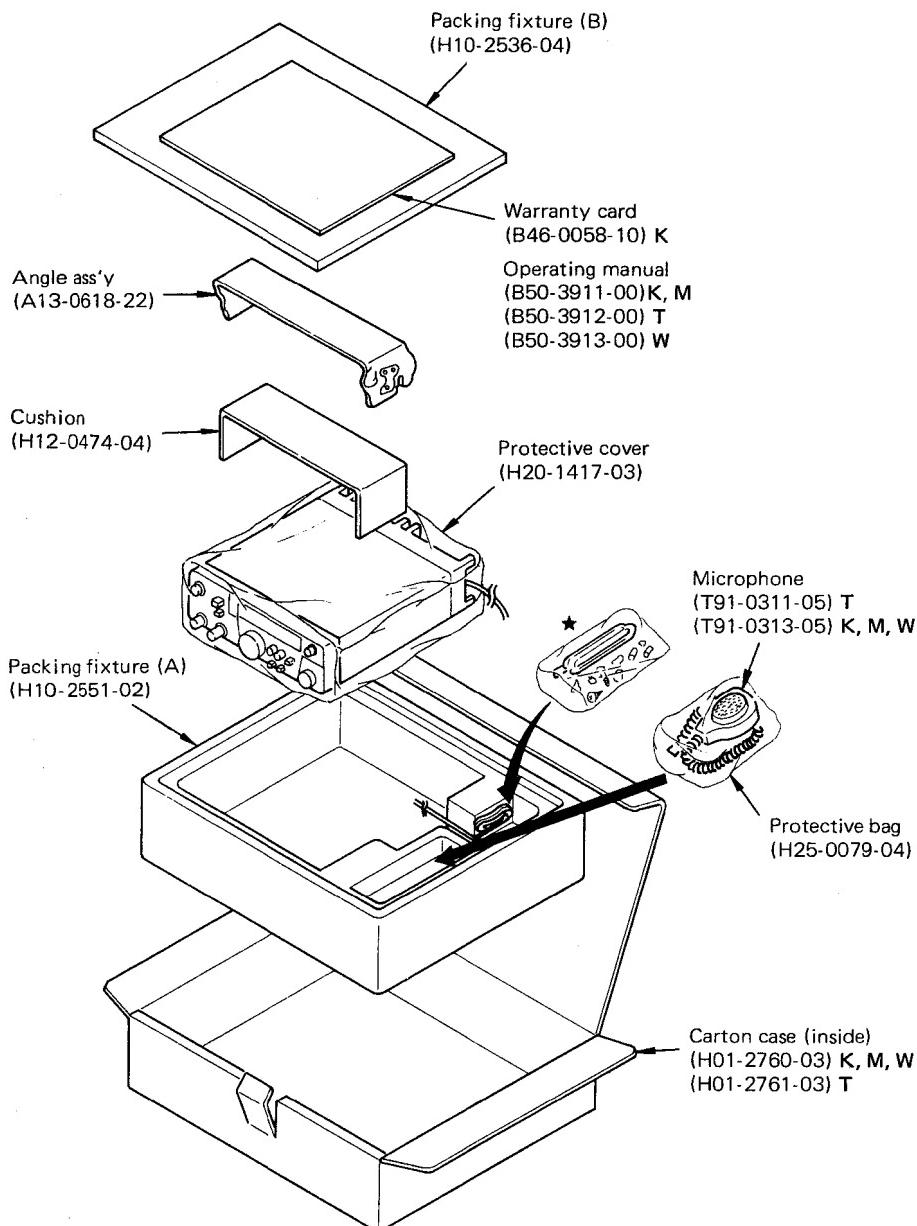
ADJUSTMENT

BOTTOM VIEW

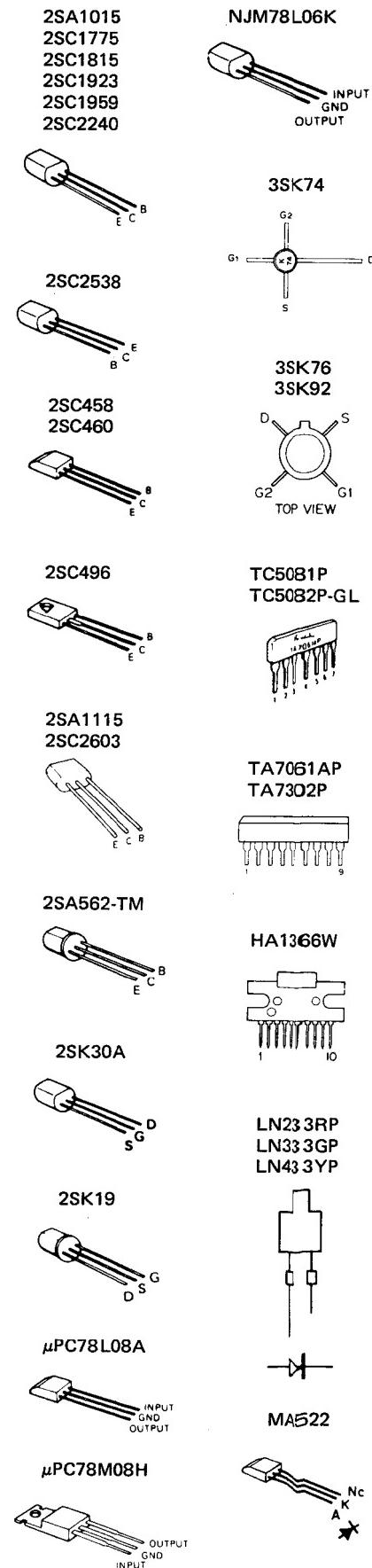


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PACKING

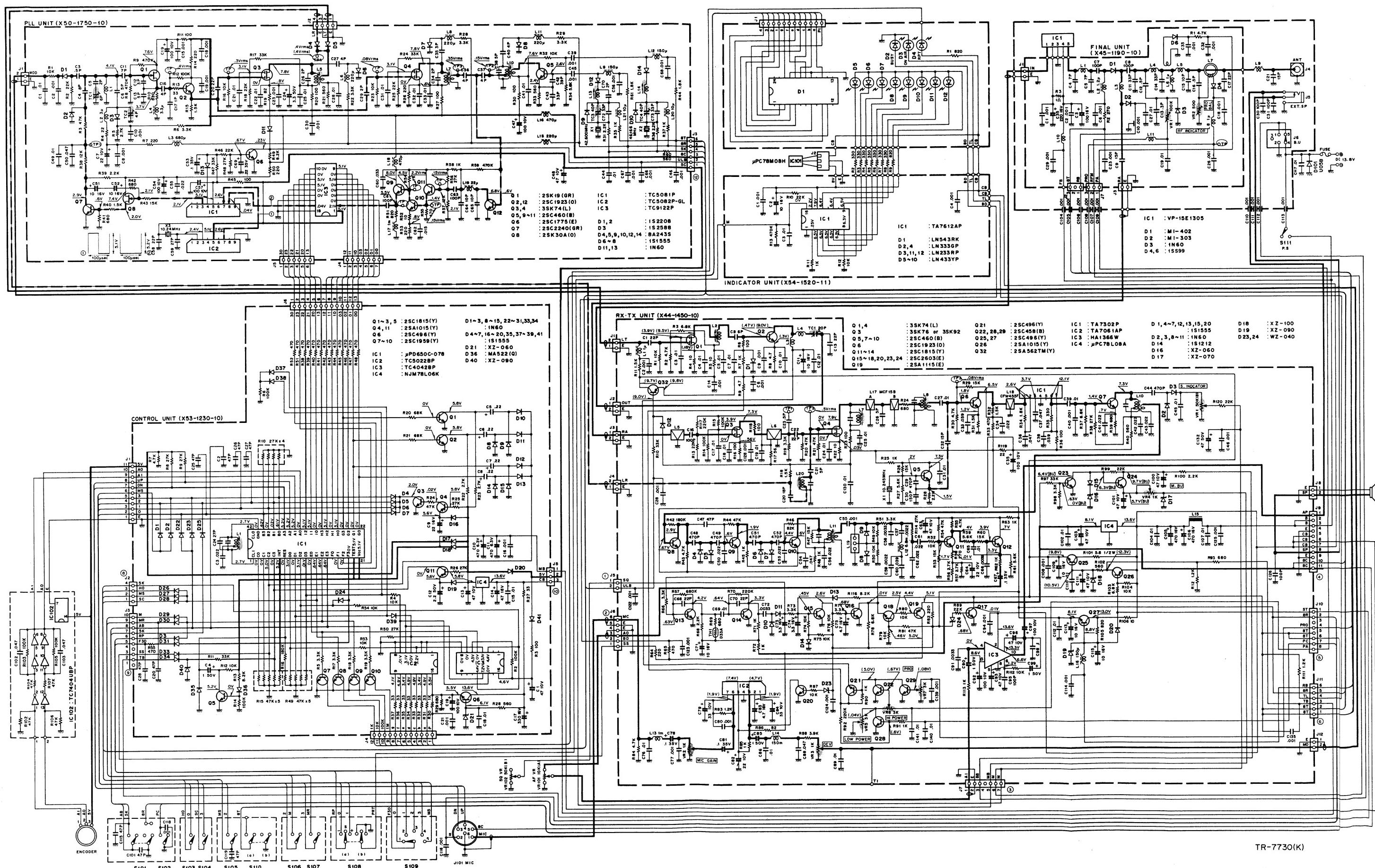


- ★ Protective bag (H25-0103-04)
- Phone plug (E12-0001-05)
- DC cord (C) (E30-1689-05)
- Fuse 6A (F05-6021-05)
- Foot x 2 (J02-0022-05) (Rear)
- Foot (J02-0420-04) (Front)
- Foot mounting hardware x 2 (J21-2676-04)
- Protective bag (H25-0029-04)
 - Boss x 4 (J32-0748-04)
 - Bind screw x 4 (N35-3012-45)
- Accessory bag (H25-0049-03)
- Round screw x 4 (N09-0008-04)
- Flange nut x 4 (N14-0510-04)
- Flat washer x 4 (N15-1060-46)
- Spring washer x 4 (N16-0060-46)
- Bind screw x 6 (N35-3006-45)

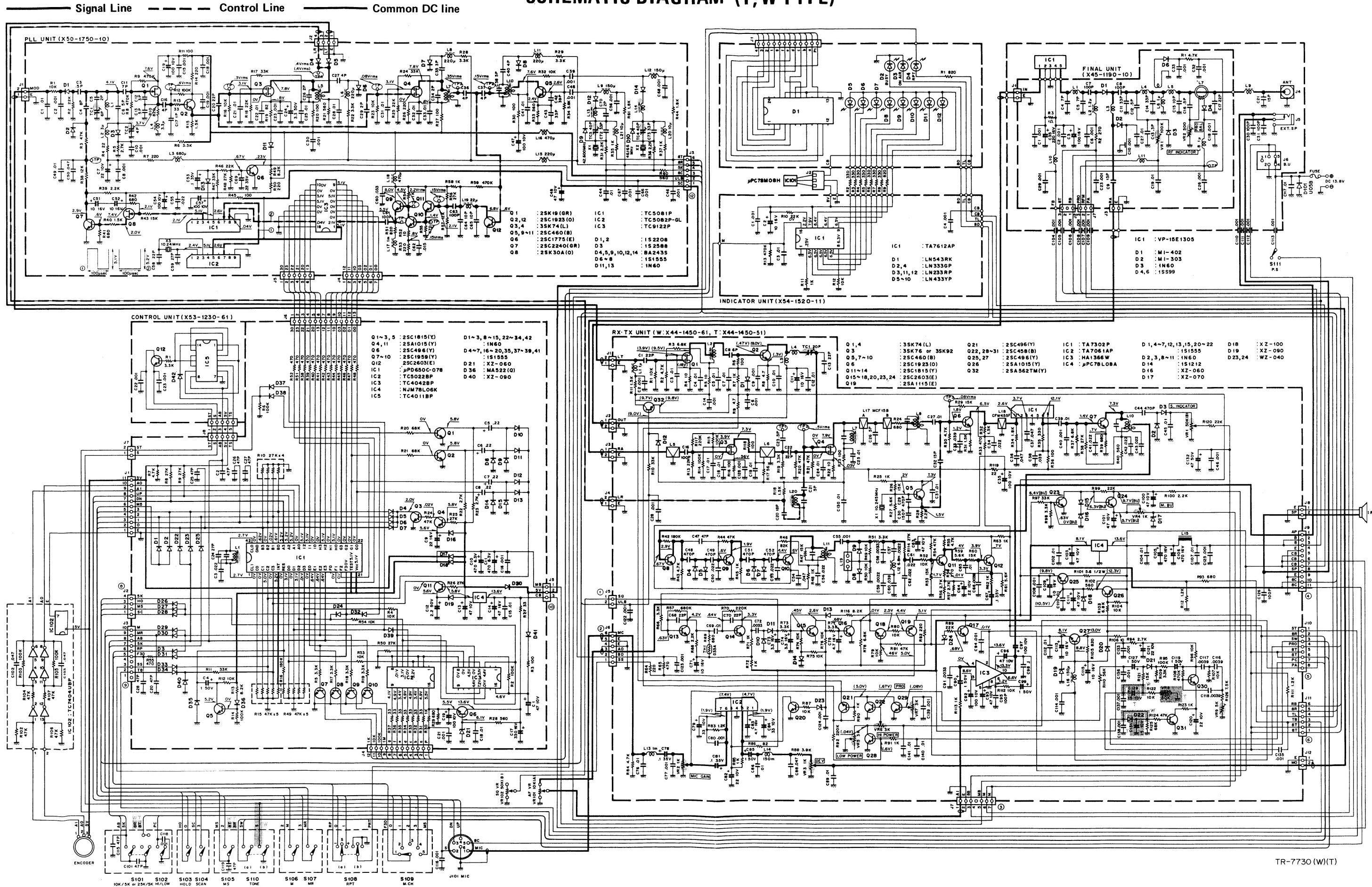


SCHEMATIC DIAGRAM (K, M TYPE)

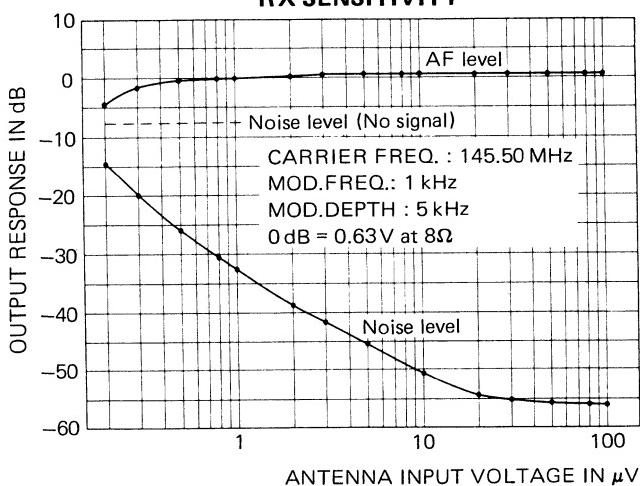
— Signal Line - - - Control Line — Common DC line



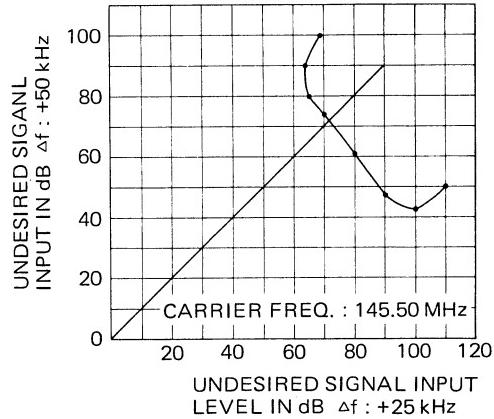
SCHEMATIC DIAGRAM (T, W TYPE)



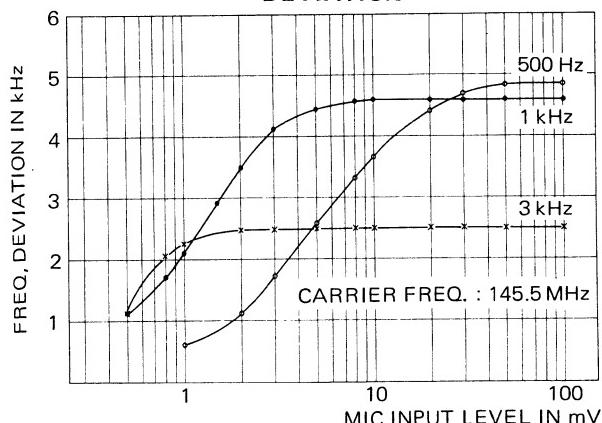
RX SENSITIVITY



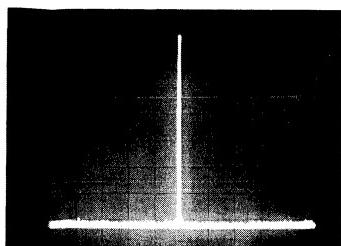
INTER MODULATION



DEVIATION



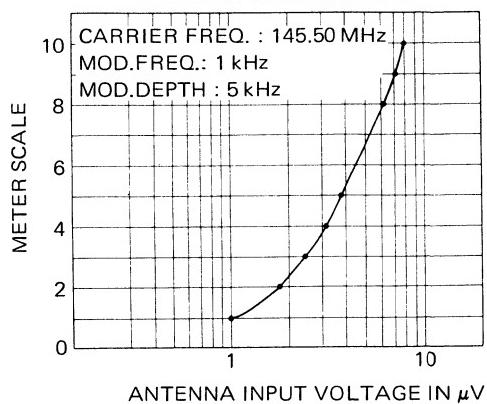
Near spurious response



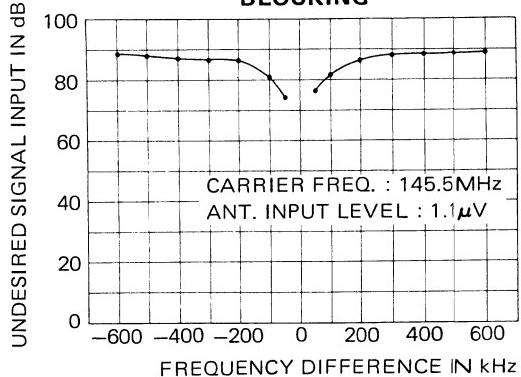
135.5 MHz
155.5 MHz
145.5 MHz Fundamental

CARRIER FREQ. : 145.50 MHz
RF POWER : 28W
SCAN WIDTH : 5 MHz/DIV
BAND WIDTH : 30 kHz
SCAN TIME : 0.1 sec
VIDEO FILTER : 10 kHz
INPUT ATT. : 20 dB
LOG REF LEVEL : -1 dBm
10 dB/DIV

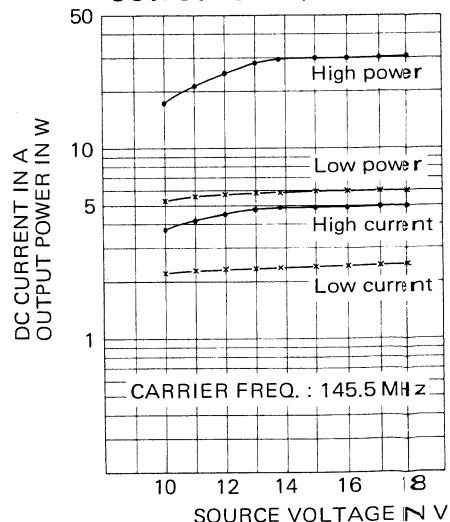
S LEVEL SENSITIVITY



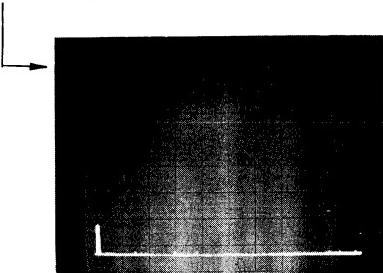
BLOCKING



OUTPUT POWER/CURRENT



Fundamental signal level*



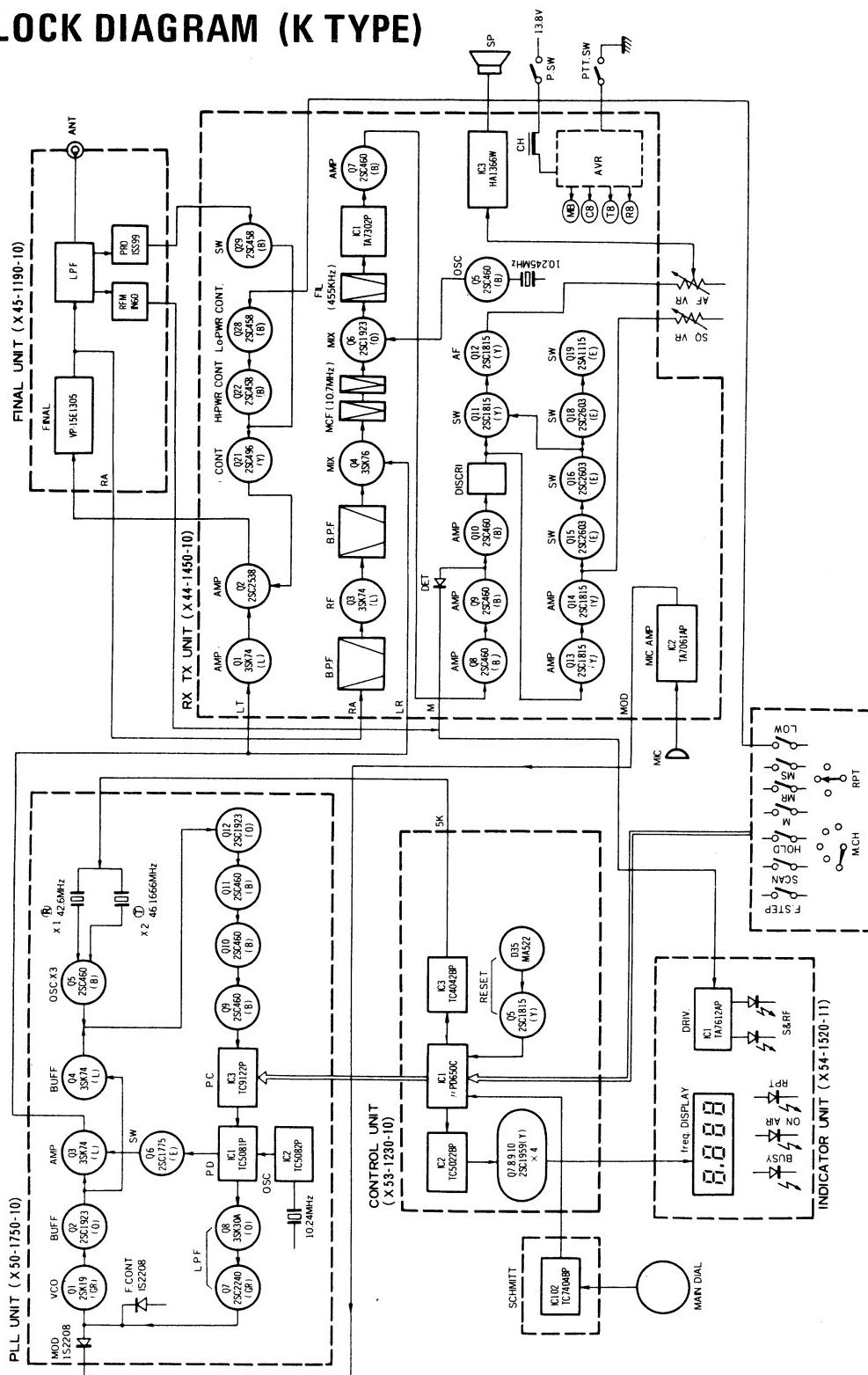
145.5 MHz Fundamental

Harmonics spurious response

CARRIER FREQ. : 145.5MHz
RF POWER : 28W
SCAN WIDTH : 100 MHz/DIV
BAND WIDTH : 300 kHz
SCAN TIME : 0.1 sec
VIDEO FILTER : 10 kHz
INPUT ATT. : 10 dB
LOG REF LEVEL : -1 dBm
10 dB/DIV

* The fundamental has been reduced in amplitude by the H.P.F.

TR-7730 BLOCK DIAGRAM (K TYPE)



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